Edward Lowe Foundation

The Entrepreneurship Score Card

MICHIGAN

Toward an Entrepreneurial Economy
2005-2006

Prepared By

The Edward Lowe Foundation
The Small Business Foundation of Michigan
GrowthEconomics, Inc.

Edward Lowe
EDWARD LOWE FOUNDATION

SMALL BUSINESS FOUNDATION OF MICHIGAN

Growth Economics

The Entrepreneurship Score Card

MICHIGAN

Toward an Entrepreneurial Economy

2005–2006

The Entrepreneurship Score Card

MICHIGAN

Toward an Entrepreneurial Economy

2005–2006

Edward Lowe Foundation
Small Business Foundation of Michigan
GrowthEconomics, Inc.

The Entrepreneurship Score Card for Michigan is a collaborative effort
of the Edward Lowe Foundation and the Small Business Foundation of Michigan.
Consultant: Graham Toft, Ph.D., GrowthEconomics, Inc.

The 2004–2005 inaugural edition was created and produced
by the Small Business Foundation of Michigan.

The Edward Lowe Foundation became the underwriter of the research
and an active participant in the production of the *Score Card* with the 2005–2006 edition.

Financial Support From the Following Organizations Is Gratefully Acknowledged

AT&T
Automation Alley
Central Michigan University, LaBelle Entrepreneurial Center
Lawrence Technological University, Lear Entrepreneurial Center
Michigan Energy Resource and Research Association.
Michigan Entrepreneurial Education Network (MEEN), CyberMichigan
Michigan Venture Capital Association
NextEnergy
Shepherd Advisors LLC
Small Business Association of Michigan, Entrepreneurial Development Center

Special Thanks to Lawrence Technological University
for Design and Production Assistance

Collaborating Organizations

Edward Lowe Foundation
www.edwardlowe.org

Edward and Darlene Lowe created the foundation in 1985 to "champion the entrepreneurial spirit" by providing information, research and educational experiences that support entrepreneurship. Edward Lowe was the inventor of Kitty Litter and a recognized advocate of the importance of entrepreneurship to the free enterprise system.

Today, the foundation offers three main initiatives to support the intentions of its founders. The *PeerSpectives® Roundtable System* helps second-stage business owners learn from each other. The *Companies to Watch℠* awards program celebrates the vital role of second-stage companies in the American economy. *The Entrepreneurship Score Card™* measures the "entrepreneurial dynamism" of states and identifies areas for improvement. The foundation's Big Rock Valley headquarters near Cassopolis, Michigan, is a vibrant retreat center and nature conservancy.

Small Business Foundation of Michigan
www.sbam.org

Headquartered in Lansing and founded by the past directors of the Small Business Association of Michigan (SBAM), the foundation supports research, education and projects, based on the *Entrepreneurship Score Card* findings, that promote awareness and stimulate the development of entrepreneurial small business in Michigan. Mark H. Clevey, a nationally recognized and award-winning expert in entrepreneurship, serves as the Small Business Foundation of Michigan (SBFM) executive director.

In addition to *The Entrepreneurship Score Card*, a key foundation initiative is the "Small Business Barometer" that surveys and measures the pulse of Michigan small businesses on issues relating to their growth and prosperity. The foundation also supports the SBAM Entrepreneurial Development Center (EDC) whose aim is to stimulate an Entrepreneurial Economy in Michigan, characterized by the robust the creation, retention, expansion and attraction of first- and second-stage entrepreneurial small businesses.

GrowthEconomics, Inc.

An economic-development consulting firm, GrowthEconomics focuses on the application of economic-growth theories to contemporary economies. The firm conducts research emphasizing competitive position as a basis for actionable strategies. Its primary focus is the role that growing companies play in economic growth.

Nationally recognized founder Graham Toft, Ph.D. consults for state governments and localities on a variety of economic development issues. He has been named Distinguished Professional Planner by the Indiana Planning Commission, served for three years as the president of the Indiana Economic Development Council, Inc., and was a senior fellow at the Hudson Institute. GrowthEconomics is based in the town of Longboat Key, Florida.

Table of Contents

iii Acknowledgments
iv Collaborating Organizations

2 **Executive Summary**

6 **Introduction**

10 **Key Findings 1: Primary Drivers of Entrepreneurial Dynamism**
10 Background and Discussion
15 Table 1: Michigan's Performance 2005: Grade, Rankings, Ratings
Table 2: All States 2005, 2003, 2001: Grades

16 **Key Findings 2: Secondary Drivers of Entrepreneurial Dynamism**
16 Education and Workforce Development
17 Business Costs and Productivity
17 Government Efficiency and Regulatory Environment
17 Infrastructure
18 Quality of Life

19 **Improving Entrepreneurial Dynamism in Michigan**

27 **Context, Progress and Opportunities**
29 Entrepreneurial Business Growth in Michigan
34 Progress and Opportunities 2004–2006

39 **Appendices**
40 Appendix 1: Factors Influencing Entrepreneurial Dynamism
42 Appendix 2: Michigan Performance 2005, 2003, 2001: All Metrics
46 Appendix 3: Score Card Structure
Listing of All Metrics
50 Appendix 4: Improving Entrepreneurial Dynamism in Michigan: Supplement
57 Appendix 5: Data Sources
75 Appendix 6: Methodology: Entrepreneurship Score Card
77 Appendix 7: Methodology: Progress and Opportunities 2004–2006
List of Respondents
79 Appendix 8: How Other Studies Rate Michigan's Economy
82 Appendix 9: Glossary

86 **Complete Raw Score Results by Individual Metric**
Raw Scores and Descriptions of Metrics
Comparisons with Midwest Competitor States

Executive Summary
Entrepreneurial Dynamism in Michigan 2005
Grade: D

Major Factors of Growth. *The Entrepreneurship Score Card* is grounded in contemporary theories of economic growth that, taken together, identify four *major factors* that affect growth:

- Innovation
- Human Capital
- Investment Capital
- Entrepreneurship

These four major factors together move an economy forward or hold it back because they are interconnected in many complex ways. These factors exert the most influence on economic conditions in times of rapid economic transition dominated by technological, market, and demographic changes.

Focusing on Entrepreneurship. While recognizing that innovation, human capital and investment capital are essential to economic growth, the *Score Card* focuses on entrepreneurship and the eight *drivers* that influence it. Three *primary drivers* most affect the level and quality of entrepreneurship in a state or region; five *secondary drivers* also exert influence but less directly. To simplify analysis and benchmarking, the *Score Card* combines the three primary drivers into a single composite measure—Entrepreneurial Dynamism—created specifically for the S*core Card.*

The primary drivers of Entrepreneurial Dynamism measure entrepreneurial *change*, entrepreneurial *vitality* and entrepreneurial *climate*.

Primary Drivers	Measure
• Entrepreneurial *Change*	The amount of entrepreneurial growth or decline *Includes: Growth in Number of Small Businesses, Small-Business Payroll Growth and other metrics*
• Entrepreneurial *Vitality*	The absolute level of entrepreneurial activity *Includes: High-Performance Companies, University Spinout Businesses, SBIR Awards and other metrics*
• Entrepreneurial *Climate*	The capability of an economy to foster entrepreneurship *Includes the subdrivers Ideas/Innovation, Financial/Institutional Capital and General Growth*

Michigan's D grade in Entrepreneurial Dynamism indicates virtually no movement in its three primary drivers in five years. Although the score is up slightly from last year, the change may not be statistically significant, and Michigan trails most other states. As the table on the next page shows, it falls into a lower-performing group, second from the bottom, along with 20 others, including its Midwest competitors.

Where does a D grade put Michigan in relation to other states? Two tables provide answers from slightly different perspectives. At right, it's clear from the number of A grades (three) vs. the number of C and D grades (32) that few states are competitive in Entrepreneurial Dynamism.

Grade Distribution All States

Grade	# of States
A	3
B	8
C	11
D	**21**
F	7

The primary drivers table below expresses Michigan's competitive position in Entrepreneurial Dynamism in terms of rankings and ratings. *Rankings* show the *absolute* position of a state in order of scores. *Ratings* provide a snapshot of a state's competitive position *relative* to the other states by placing it into one of five groups that quickly show how far apart the scores are, not just their order.

Entrepreneurial Dynamism and Primary Drivers: Michigan 2005, 2003, 2001

2005–2006 GRADE	**D**			
	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Entrepreneurial Dynamism	**31**	**	*	*
Entrepreneurial **Change**	**44**	**	**	*
Entrepreneurial **Vitality**	**28**	*	*	*
Entrepreneurial **Climate**	**25**	**	**	*

Rankings: 50 States **Ratings:** Lowest * to Highest *****

Drivers Influencing Entrepreneurial Dynamism

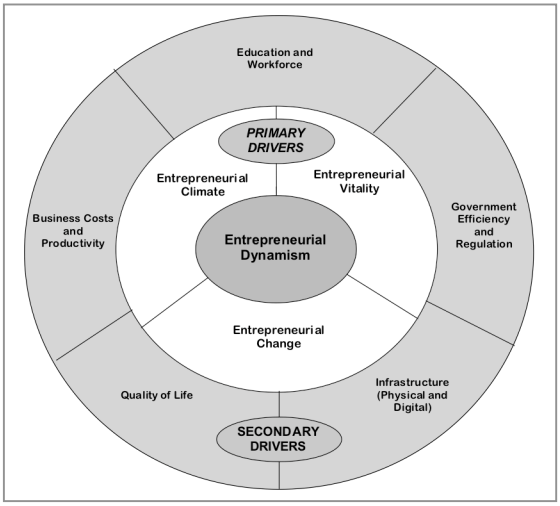
This graphic shows the relationships among the drivers of Entrepreneurial Dynamism.

Primary Drivers

Entrepreneurial Change
Entrepreneurial Vitality
Entrepreneurial Climate

Secondary Drivers

Education and Workforce Development
Business Costs and Productivity
Government and Regulatory Environment
Infrastructure
Quality of Life



Midwest Competitors: Understanding Michigan's performance in Entrepreneurial Dynamism relative to competing states is vitally important. In the decades ahead, prosperous state economies will be those with a vibrant small business and entrepreneurial sector. This chart shows how Michigan's Midwest competitors compare.

Entrepreneurial Dynamism: Midwest Competitors

	2005	2003	2001
Wisconsin	D+	C-	D+
Ohio	D+	D	D+
Michigan	**D**	**D-**	**F**
Illinois	D	D-	D-
Indiana	D	D+	C-

Entrepreneurial Dynamism's Role in Overall Competitiveness: Of the top 10 states in overall economic competitiveness in four other recognized studies, six are also in the top 10 in Entrepreneurial Dynamism as reported by the *Score Card*, an indication of the importance of an entrepreneurial economy.

Top States in Entrepreneurial Dynamism and Overall Competitiveness[1]

Score Card 2006 **Rank**	**Entrepreneurial Dynamism**	**Overall Competitiveness**	Other Studies **Rank**
1	Massachusetts	Massachusetts	1
7	Colorado	Colorado	2
4	Virginia	Virginia	3
8	Utah	Utah	5
5	Maryland	Maryland	6
6	Washington	Washington	8

[1] Development Report Card for the States (Corporation for Enterprise Development), MAC Index (Manufacturing Alliance of Connecticut), State Competitiveness Report (Beacon Hill Institute), State Technology & Science Index (Milken Institute). The overall competitiveness rankings are composites based on the related measures in these studies.

Some Secondary Driver Scores Are Higher

Secondary drivers also influence progress toward an entrepreneurial economy. In general, Michigan shows stronger performance in these arenas than in those of the primary drivers that comprise Entrepreneurial Dynamism.

Secondary Driver Rankings and Ratings: Michigan 2005, 2003, 2001

	2005		2003	2001
	Ranking	Rating	Rating	Rating
Education & Workforce	**8**	***	***	***
Business Costs & Productivity	**37**	***	***	**
Government Efficiency & Regulatory Environment	**13**	***	***	****
Infrastructure	**42**	**	**	***
Quality of Life	**33**	***	***	****

Conclusions

Stimulating "growth from within" is a key challenge for Michigan decision makers. That means stimulating and supporting entrepreneurship by focusing on initiatives that spur investment in high-growth, high-value-adding firms and industries and accelerate the flow of discoveries in research to commercialization in the marketplace.

Opportunity: The other Midwest states are in the same low-performing group as Michigan. That Entrepreneurial Dynamism and overall competitiveness appear to be linked signals a clear opportunity for Michigan to bypass its Midwest competitors by accelerating movement toward a truly entrepreneurial economy. Some strategies include increasing technology transfer to the marketplace, supporting free flow of strategic information, creating incentives to finance entrepreneurial companies, developing entrepreneurship education, improving digital infrastructure, and nurturing peer networking and peer learning among business owners. Strong scores in some of the secondary drivers show that the state is well positioned for significant improvement over time.

Introduction

The Entrepreneurship Score Card for Michigan for 2005–2006 is a snapshot of the state's economy viewed through the lens of entrepreneurship. Its central measure—Entrepreneurial Dynamism—helps a state understand its competitive position compared to other states and was created specifically for use in the *Score Card*. An annual benchmarking report, the *Score Card* is widely distributed to policymakers, stakeholders in economic development and key decision-makers in Michigan.

Goals

Awareness	To focus attention on entrepreneurial activity as an essential, if sometimes elusive, factor in economic growth.
Benchmarking	To provide a series of metrics from which to benchmark Michigan's progress toward an entrepreneurial economy relative to that of other states and to identify challenges and opportunities.
Dialogue and Action	To offer a common ground for discussion and action among policymakers, economic development practitioners and the public, leading to the aggressive development of an entrepreneurial economy.

Insight: Understanding Michigan's competitive position in Entrepreneurial Dynamism relative to other states is vitally important. In the decades ahead, prosperous state economies will be those with a vibrant small business and entrepreneurial sector—in other words, a *dynamic entrepreneurial economy*. An entrepreneurial economy is characterized by the robust creation, retention, expansion and attraction of first- and second-stage small-business entrepreneurs and their companies.

Nature and Value of the *Score Card*

The *Score Card's* focus on entrepreneurship sets it apart from other studies of economic conditions. The *Score Card* collects, arranges and interprets a comprehensive range of data and reduces it to a single measure—Entrepreneurial Dynamism. This new measure can help policymakers and the public more easily understand Michigan's competitive position relative to other states, especially those with which it competes most directly. The longitudinal nature of the *Score Card* provides tracking of positive, or negative, movement in this measure.

Since the *Score Card's* inaugural edition (2004–2005), the concept of Entrepreneurial Dynamism has become a critical consideration in planning by the state's government, civic and business leaders. The reason: As Michigan's traditional manufacturing sector undergoes a major transformation, agile small and midsize companies are setting the pace in such areas as advanced manufacturing; medical devices; new energy technologies; nanotechnology; healthcare; home security; and entertainment, travel and tourism. Interest in how to create more of these kinds of companies and nurture those that already exist runs high.

There are several improvements to this year's *Score Card*:

- Only one outcome receives a grade: Entrepreneurial Dynamism.
- Ratings clarify Michigan's competitive performance relative to other states.
- An executive summary makes key results easier to find.
- The scoring and grading method has been sharpened using a state of the art technique to normalize the raw scores of 126 metrics.
- A glossary lists and explains key terms.
- A survey of Michigan economic development professionals offers perspective on progress and opportunities in entrepreneurship since *Score Card* data were compiled.

Why Entrepreneurship Matters

American entrepreneurship and the entrepreneurial American economy are the envy of the world because they constitute a tremendous competitive advantage for the United States. In the same way, entrepreneurship and entrepreneurial economies *could be* tremendous competitive advantages for individual states; however, they are for surprisingly few states.

Insight: Few states are doing a superior job—or even a good job—of developing entrepreneurship and entrepreneurial economies for competitive advantage. Just three of the 50 states received an A grade in Entrepreneurial Dynamism for 2005, while 21 received a D grade—including Michigan.

Why does entrepreneurship matter? Since the late 1990s, research has shown that growing companies—entrepreneurial companies—are the central driving force behind economic prosperity, growth and development. States with a large and increasing base of such companies have an economic advantage, especially in times of rapid change such as these. Increasing globalization means that entrepreneurship will be more widely practiced outside of the United States, and building and sustaining a competitive advantage will become much more difficult. Staying ahead will depend largely on the ability of an economy to create and maintain an environment in which entrepreneurs and their growing companies can thrive.

Your comments on the *Score Card* are welcomed. Please send comments directly to:

Mark H. Clevey, MPA
Executive Director, Small Business Foundation of Michigan
Vice President, Entrepreneurial Development, Small Business Association of Michigan
222 N. Washington Square, Suite 100
P.O. Box 16158
Lansing, MI 48901-6158
800-362-5461
mhc@sbam.org

Scott Pemberton
Director, The Entrepreneurship Score Card Project
Director of Communications
Edward Lowe Foundation
58220 Decatur Road, P.O. Box 8
Cassopolis MI 49031
800-232-5693
scott@lowe.org

Key Findings 1: Primary Drivers of Entrepreneurial Dynamism

Background and Discussion

Table 1: Michigan's Performance 2005: Grade, Rankings, Ratings
Table 2: All States 2005, 2003, 2001: Grades

Key Findings 2: Secondary Drivers of Entrepreneurial Dynamism

Education and Workforce Development
Business Costs and Productivity
Government Efficiency and Regulatory Environment
Infrastructure
Quality of Life

Key Findings 1: Primary Drivers
Entrepreneurial Dynamism in Michigan 2005 Grade: D

Background

Major Factors of Growth. *The Entrepreneurship Score Card* is grounded in contemporary theories of economic growth that, taken together, identify four *major factors* affecting growth:

- Innovation
- Human Capital
- Investment Capital
- Entrepreneurship

These four major factors together move an economy forward—or hold it back. They are interconnected in many complex ways. These factors exert the most influence on economic conditions in times of rapid economic transition dominated by technological, market and demographic changes. Each major growth factor is itself influenced by a number of factors.

What does each major factor consist of? *Innovation* is the process by which discoveries and research are commercialized for the marketplace. The more well-known commercialized research outcomes often spring from science or technology. *Human capital* is simply the quality of the work force available, and that is influenced by its own set of factors, such as the quality of education and training. *Investment capital* refers not only to financial investment but also to institutional and cultural investment, including such factors as quality of life. *Entrepreneurship* is often described as the pursuit of opportunity using limited resources to create products or services to make a profit.

Drivers Influencing Entrepreneurship. While recognizing that innovation, human capital and investment capital are essential to economic growth, the *Score Card* focuses on entrepreneurship and the eight *drivers* that influence it. Three *primary drivers* most affect the level and quality of entrepreneurship in a state or region; five *secondary drivers* also exert influence, but less directly. To simplify analysis and benchmarking, the *Score Card* combines the three primary drivers into a single composite measure—Entrepreneurial Dynamism—created specifically for the S*core Card.*

The primary drivers of Entrepreneurial Dynamism measure entrepreneurial *change*, entrepreneurial *vitality* and entrepreneurial *climate*.

Primary Drivers	Measure
• Entrepreneurial *Change*	The amount of entrepreneurial growth or decline *Includes: Growth in Number of Small Businesses, Small-Business Payroll Growth and other metrics*
• Entrepreneurial *Vitality*	The absolute level of entrepreneurial activity *Includes: High-Performance Companies, University Spinout Businesses, SBIR Awards and other metrics*
• Entrepreneurial *Climate*	The capability of an economy to foster entrepreneurship *Includes the subdrivers Ideas/Innovation, Financial/Institutional Capital, and General Growth*

Discussion

D Grade Signals Little Improvement In Entrepreneurial Dynamism Drivers

The 2005–2006 *Score Card* gave Michigan a grade of D in Entrepreneurial Dynamism. This grade indicates virtually no movement in the three primary drivers of Entrepreneurial Dynamism in five years. Michigan trails most states in this measure. Michigan is significantly behind the leading states and is grouped with 20 other low-performing states, including its Midwest competitors.

Where does a D grade put Michigan in relation to other states? Two tables provide answers from slightly different perspectives. At right, it's clear from the number of A grades (three) vs. the number of C and D grades (32) that few states are competitive in Entrepreneurial Dynamism.

Grade Distribution All States

Grade	# of States
A	3
B	8
C	11
D	**21**
F	7

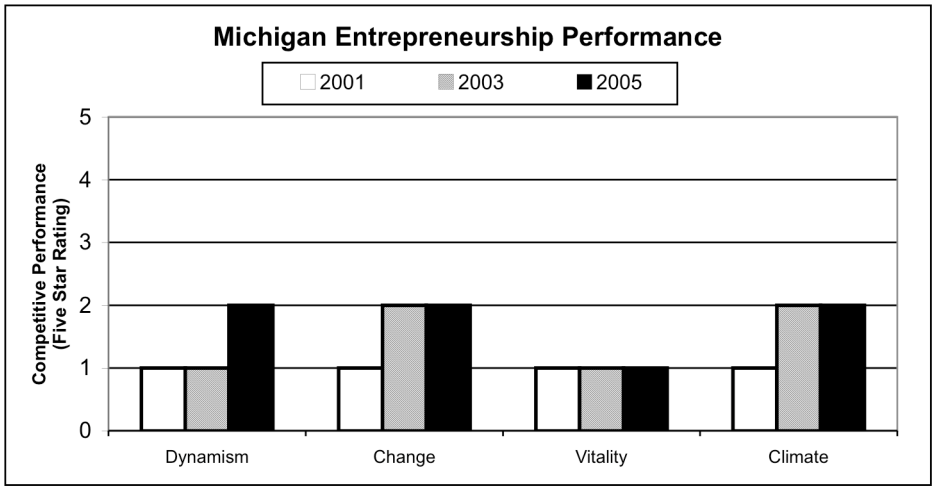
The primary drivers table below expresses Michigan's competitive position in Entrepreneurial Dynamism in terms of rankings and ratings. *Rankings* show the *absolute* position of a state in order of scores. *Ratings* provide a snapshot of a state's competitive position *relative* to the other states by placing it into one of five groups that quickly show how far apart the scores are, not just their order. This year the *Score Card* uses the five-star cluster method to show Michigan's competitive position with respect to other states for 2005, 2003 and 2001.

Entrepreneurial Dynamism and Primary Drivers: Michigan 2005, 2003, 2001

2005–2006 GRADE	**D**			
	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Entrepreneurial Dynamism	**31**	**	*	*
Entrepreneurial **Change**	**44**	**	**	*
Entrepreneurial **Vitality**	**28**	*	*	*
Entrepreneurial **Climate**	**25**	**	**	*

Rankings: 50 States **Ratings:** Lowest * to Highest *****

The bar graph below offers a different perspective. The state's performance in Entrepreneurial Dynamism has shown some improvement over time, though its ratings show that it has not gained ground against other states.



Ratings: Lowest: One Star * to Highest: Five Stars *****

Other Midwest States

Michigan's scores and grades in Entrepreneurial Dynamism from 2001 to 2005 are similar to those of other Midwest states. Poor performance in Entrepreneurial Dynamism means that Michigan, along with the rest of the Midwest, will have to work hard to achieve a dynamic entrepreneurial economy.

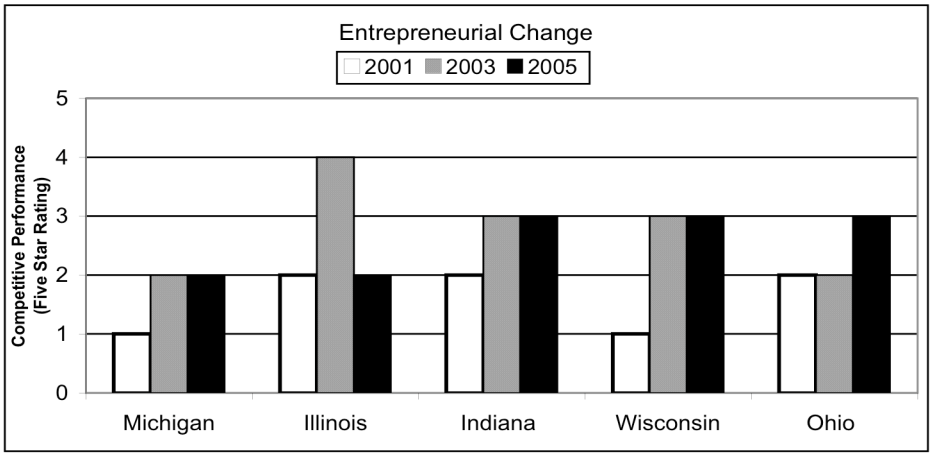
Entrepreneurial Dynamism: Midwest Competitors

	2005	**2003**	**2001**
Wisconsin	D+	C-	D+
Ohio	D+	D	D+
Michigan	**D**	**D-**	**F**
Illinois	D	D-	D-
Indiana	D	D+	C-

Insight: Similar performance by other Midwest competitor states creates a keen competitive environment. But it also creates an opportunity for Michigan to develop the pre-eminent regional entrepreneurial economy and to surpass its regional competitor states.

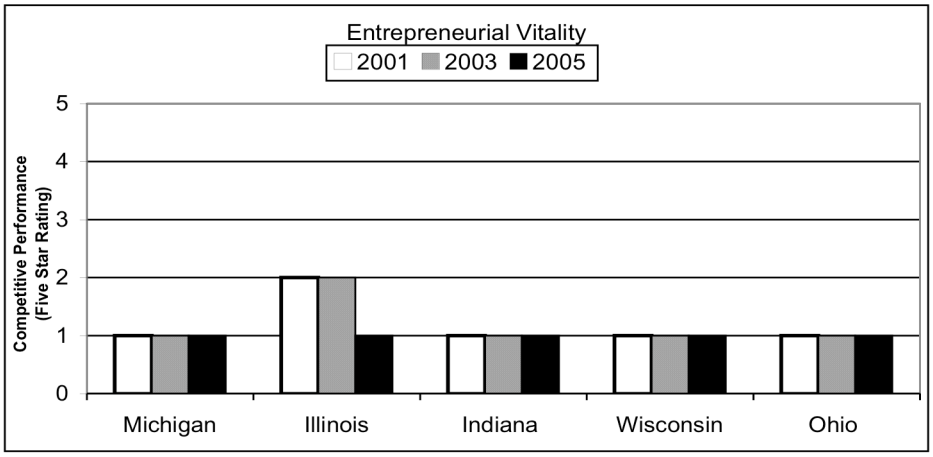
Overall, the following graphs show slower entrepreneurial growth for Michigan relative to other Midwest states. Indiana, Wisconsin and Ohio show encouraging signs in entrepreneurial change over the past three years, while Michigan lags. Entrepreneurial vitality has been disappointing for all Midwest states, and Michigan is no exception. In entrepreneurial climate, Michigan scores much the same over the years as other Midwest states, with Wisconsin moving into a three-star rating.

Entrepreneurial Change: Amount of Entrepreneurial Growth



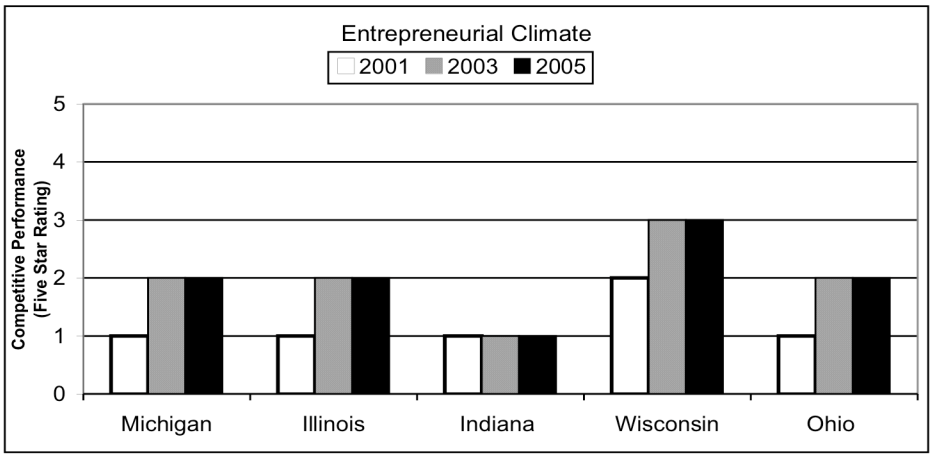
Ratings: Lowest: One Star * to Highest: Five Stars *****

Entrepreneurial Vitality: Level of Entrepreneurial Activity



Ratings: Lowest: One Star * to Highest: Five Stars *****

Entrepreneurial Climate: Capability to Foster Entrepreneurship



Ratings: Lowest: One Star * to Highest: Five Stars *****

Entrepreneurial Dynamism's Role in Overall Competitiveness: Of the top ten states in overall economic competitiveness as reported by other recognized studies, six are also in the top ten states in Entrepreneurial Dynamism as reported by the *Score Card*.

Some of these states have been strong performers for decades, while others are relatively new to the top ten. What distinguishes their overall performance, however, is their adaptability to economic change and their leadership in areas essential to an entrepreneurial economy—such as software development, information technology, advanced business services and high-tech transformation, including advanced manufacturing.

Top States in Entrepreneurial Dynamism and Overall Competitiveness[2]

Score Card 2006 **Rank**	**Entrepreneurial Dynamism**	**Overall Competitiveness**	Other Studies **Rank**
1	Massachusetts	Massachusetts	1
7	Colorado	Colorado	2
4	Virginia	Virginia	3
8	Utah	Utah	5
5	Maryland	Maryland	6
6	Washington	Washington	8

[2] Development Report Card for the States (Corporation for Enterprise Development), MAC Index (Manufacturing Alliance of Connecticut), State Competitiveness Report (Beacon Hill Institute), State Technology & Science Index (Milken Institute). The overall competitiveness rankings are composites based on the related measures in these studies.

Entrepreneurial Dynamism

Table 1. Michigan's Performance 2005
Primary Drivers - Rankings and Ratings

Grade	*D*	
	Ranking	**Rating**
Entrepreneurial Dynamism	**31**	**
Entrepreneurial Change	**44**	**
Growth in Number of Small Businesses	46	
Increase in High Performance Companies	28	
New Business Churn Growth	22	
Small Business Payroll Growth	48	
Non-Wage Income Per Capita Growth	28	
Entrepreneurial Vitality	**28**	*
New Business Churn	27	
Self-employment	38	
University Spinout Businesses	25	
High-Performance Companies	18	
IPO Awards	24	
SBIR Awards	27	
STTR Awards	12	
SBIC Awards	31	
Entrepreneurial Climate	**25**	**
Ideas and Innovations	21	**
Small Businesses University Licenses/Options	15	
University Research and Development	20	
Patents	11	
Patent Productivity	36	
NSF Proposal Funding Rate	15	
SBIR Funding Rate	29	
Financial and Institutional Capital	**20**	**
Venture Capital Financing	27	
IPO Financing	10	
SBIC Financing	37	
SBIR Financing	30	
STTR Financing	20	
Bank Commercial and Industrial Lending	11	
Private Lending to Small Businesses	6	
Business Incubators	38	
General Growth	**22**	**
Gross State Product Growth	50	
Fortune 500 Headquarters	8	
Capital Investment Growth in	19	
Foreign Direct Investment Growth	5	
Export Growth	34	
Large Business Payroll Growth	39	
Building Permits	34	
Industry Research and Development	1	
Federal Research and Development	40	
University Royalty/License Income	8	
Entrepreneurial Cohort	27	
Net Migration Rate	42	

Table 2. All States 2005, 2003, 2001
Grades

State	2005	2003	2001
Massachusetts	A+	A+	A+
California	A	A	B
New Mexico	A-	C+	C+
Virginia	B+	A-	B+
Maryland	B+	C+	C+
Washington	B	C+	C
Colorado	B	B-	B
Utah	B-	B-	B-
New York	B-	C-	C-
Rhode Island	B-	C	D+
Texas	B-	D+	D
Delaware	C+	D	D
Georgia	C+	D-	D
Montana	C	D+	D+
Nevada	C	C	D+
North Carolina	C	C-	C
Arizona	C	C	D+
New Hampshire	C-	C-	D
Idaho	C-	C	D
Iowa	C-	C	B-
Alabama	C-	D+	D-
Minnesota	C-	D	F
Wisconsin	D+	C-	D+
South Dakota	D+	D+	D
New Jersey	D+	C	C-
Florida	D+	D+	D+
Pennsylvania	D+	D	D-
Ohio	D+	D	D+
Oregon	D	D	D+
Hawaii	D	D-	D
Michigan	**D**	**D-**	**F**
Tennessee	D	D+	D-
Vermont	D	D+	D
Illinois	D	D-	D-
Indiana	D	D+	C-
Connecticut	D	C-	D+
Missouri	D-	D-	F
Oklahoma	D-	D-	D-
Maine	D-	D-	D
South Carolina	D-	D	D
Mississippi	D-	D-	F
Arkansas	D-	F	F
Wyoming	D-	D-	F
Nebraska	F	D	D
Kentucky	F	D-	F
Louisiana	F	F	F
West Virginia	F	F	F
Alaska	F	F	F
Kansas	F	F	F
North Dakota	F	D	D

Key Findings 2: Secondary Drivers

Education and Workforce Development
Business Costs and Productivity
Government Efficiency and Regulatory Environment
Infrastructure
Quality of Life

Secondary drivers also influence progress toward an entrepreneurial economy. In general, Michigan shows stronger performance in these arenas than in those of the primary drivers that comprise Entrepreneurial Dynamism.

Note: A full listing of Michigan's performance for secondary drivers, subdrivers, and metrics can be found in *Appendix 2*.

The chart below shows how Michigan rated in the five secondary drivers. From 2001 to 2005 the state improved slightly in Business Costs and Productivity and in Government Efficiency and Regulatory Environment, and it held steady in Education and Workforce. But in Quality of Life, Michigan slipped to a three-star rating from a four-star rating. The state has also fallen to a lower tier in Infrastructure.

Secondary Driver Rankings and Ratings

	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Education and Workforce Development	**8**	***	***	***
Business Costs and Productivity	**37**	***	***	**
Government Efficiency and Regulatory Environment	**13**	***	***	****
Infrastructure	**42**	**	**	***
Quality of Life	**33**	***	***	****

Education and Workforce Development: Still an Asset

The quality of human capital, which is measured in terms of education and workforce, is one of Michigan's strengths. Michigan gets a four-star rating in K-12 and a three-star rating in the post-secondary category. This "balanced" portfolio of people assets puts the state in a relatively strong position for today's entrepreneurial economy, which is in large part dependent on an educated workforce. Michigan's ranking in post-secondary education is particularly high at six, for example. Its score puts it at the top of the three-star group (down from four stars in 2003); only two states, California and Massachusetts, achieved five stars.

Education and Workforce Development

	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Education and Workforce Development	**8**	***	***	***
K-12 Education	24	****	****	***
Post-secondary Education	6	***	****	****
Workforce	13	***	***	**

Business Costs and Productivity: Remains Average

Overall, Michigan has a fairly competitive business costs and productivity score. Worker productivity is similar to most Midwest competitors, while business costs are a weakness. Michigan's tax policies are sustaining an "average" competitive position.

Insight: No single study of state taxes considers completely the myriad policies and systems in place among the 50 states. Consequently, the *Score Card* uses as sources two respected studies that emphasize two different approaches to reporting on taxation as a business cost: "Total State and Local Taxes" prepared by Ernst & Young and the "State Business Tax Climate Index" prepared by the Tax Foundation. The Ernst & Young report indicates that Michigan scores above the mid-point on total business tax burden as a percentage of private economic activity. The Tax Foundation ranks Michigan 49th of 50 states on its Corporate Tax Index because of what it regards as a complex tax rate structure. The Ernst & Young study demonstrates that the tax burden overall is not excessive. The Tax Foundation Index signals that the tax code might be discouraging business investment.

Business Costs and Productivity

	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Business Costs and Productivity	**37**	***	***	**
Business Costs	44	**	*	*
Productivity	19	***	***	**

Government Efficiency and Regulatory Environment: Above Average

While improvements to government efficiency and regulatory environment are constantly on the minds of business associations, economic developers and legislators, Michigan leaders can take credit for remaining ahead of the pack.

Government Efficiency and Regulatory Environment

	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Government Efficiency and Regulatory Environment	**13**	***	***	****
Government Efficiency	23	****	****	*****
Regulatory Environment	16	****	***	***

Physical and Digital Infrastructure Deserve Attention

These poor results indicate that Michigan must not lose sight of the quality of its infrastructure if it is to support a bustling 21st century economy. While specific investments can be pointed to on both digital and transportation fronts, the results below indicate that other states are doing considerably better. It is of particular concern that Michigan has lost ground to other states in its digital infrastructure since 2001

Infrastructure

	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Infrastructure	**42**	**	**	***
Physical Infrastructure	37	**	**	***
Digital Infrastructure	42	**	**	***

Quality of Life: Average to Above Average

In the three subdrivers Economic Indicators, Health, and Environmental Quality, Michigan is performing well with a four-star rating, while underperforming in three other subdrivers. Combining all metrics into the Quality of Life driver, Michigan slipped to a three-star rating from a four-star rating between 2001 and 2005. Quality of Life has been shown to be a factor in attracting and retaining the qualified and creative workforce necessary for growth in an entrepreneurial economy, as well as the entrepreneurs themselves.

Quality of Life

	2005		2003	2001
	Ranking	**Rating**	Rating	Rating
Quality of Life	**33**	***	***	****
Economic Indicators	25	****	****	*****
Health	17	****	***	****
Environmental Quality	30	****	***	****
Public Safety	36	**	**	**
Leisure and Entertainment	34	**	*	**
Outdoor Recreation	35	*	*	**
Diversity and Equity	35	***	**	***
Civic Energy	28	***	**	**

Note: A full listing of Michigan's performance for secondary drivers, subdrivers, and metrics in 2005, 2003 and 2001 can be found in Appendix 2: Michigan Performance: All Metrics.

Improving Entrepreneurial Dynamism In Michigan

Improving Entrepreneurial Dynamism in Michigan

The attributes of an entrepreneurial economy are consistent with those of a knowledge or innovation economy, which has been described by the World Knowledge Competitiveness Index as an economy with "the capacity and capability to create and innovate new ideas, thoughts, processes and products and to translate these into economic value and wealth."

The "vertical" economic-development strategy, sometimes referred to as "economic hunting," continues to be the norm for most economic-development programs in the United States However, the knowledge/innovation economy has caused some economic-development thought leaders to consider whether traditional economic development approaches and incentives are still sufficient to enable growth or stability. Though the costs of doing business remain important, a real challenge for Michigan goes beyond cost issues to growth challenges: how to stimulate growth from within, an approach sometimes called "economic gardening." A factor vital to successfully stimulating growth from within is encouraging and supporting entrepreneurship.

While not losing sight of the importance of a healthy overall business climate, Michigan would do well to focus on new initiatives that spur investment in high-growth, high-value-adding firms and industries and accelerate the flow of discoveries in research to commercialization in the marketplace. Some new policy actions in recent years do follow this path. But the Entrepreneurial Dynamism score and underlying metrics of this report indicate Michigan's improvement over the past five years has been disappointing and far too slow. Nothing short of a far-reaching strategy and policy shift is warranted if Michigan is to reassert itself as a growth state.

Opportunity: Since all of the Midwest states scored poorly in Entrepreneurial Dynamism, Michigan has an opportunity to bypass its Midwest competitors by accelerating movement toward a distinctively entrepreneurial economy. Within this context, Michigan's most promising strategies for stimulating entrepreneurial activity in the future include the following.

1. **Balanced Growth Strategies**: The realities of today's economy call for balanced state economic-growth efforts: economic hunting *and* gardening.

   This is not to say that Michigan should forsake its business-attraction efforts, but rather to call attention to balanced economic-growth efforts that suggest more support for growth from within (economic gardening). Michigan continues to overemphasize vertical strategies (limiting attention to specific industries) in its major economic-development programs (the narrowly defined 21st Century Jobs Fund, for example). It is imperative that Michigan initiates a clear, consistent and robust horizontal approach to complement its vertical economic-development strategy. Such an approach should be clearly focused on the robust creation, retention, expansion and attraction of entrepreneurial first- and second-stage businesses in all industries.

   Many good efforts are supporting Michigan entrepreneurship and small-business development, but the efforts are fragmented and lack sufficient support from key institutions.

   It can be argued that Michigan displayed more entrepreneurial spirit in the past than today. However, entrepreneurial attitudes and aspirations can be rekindled in Michigan's schools, vocational and career programs, colleges, unions, chambers of commerce, lenders and other institutions and organizations. Michigan's 21st Century Jobs Fund, Competitive Edge Commercialization Program, and Early Stage Venture Capital Investment Act are but a

few of the state's current initiatives that support entrepreneurial growth. Nevertheless, the challenge of a wholesale cultural change remains.

Fostering a creative and entrepreneurial climate has as much to do with culture, values and learned optimism as with public programs. Pursuing an "idea economy" calls for tough examination of what is taught in schools, colleges, religious institutions, and families about risk taking and how to accept failure as part of the learning process. In particular, educational institutions should play a critical role by both fostering creativity and innovation in their faculty and student body and by openly exploring creative partnerships with allied business, government and civic entities.

2. **Sustained focus on "the basics":** Michigan needs to focus on creating a competitive business climate for small business and sound infrastructure, especially digital.

Competitor and comparator states continue to make improvements to their business climate and supportive infrastructure and public services. Recent tax policy changes in Ohio and Indiana are two cases close to home. Although the *Score Card* found Michigan's overall business climate "fairly" competitive with a three-star rating, changes by other states can put Michigan behind. The state needs to consider changes to its tax system that emphasize entrepreneurial businesses. For example, in deliberations about tax reform, the state should give careful consideration to how taxes at all levels of government interact to influence the creation, retention, expansion and attraction of first- and second-stage entrepreneurial small businesses.

Helping keep operating costs under control and producing cost-efficient government services continue to matter to large and small business alike, but are particularly important to small business. Businesses that have departed California over the past decade, particularly to the mountain states, are testimony that even small business can be quite mobile in today's economy. The *Score Card's* business costs subdriver deserves continued attention in Michigan's case. While the overall business tax burden is moderate, the business tax structure does not appear to motivate pro-investment behaviors. Some states appear to be doing better than Michigan with digital infrastructure, especially in accelerating broadband applications for small and midsize businesses.

3. **Entrepreneurship as a "social leveler":** Michigan should fully embrace entrepreneurship across age, multicultural and international dimensions.

Individuals from different cultures and ethnic and racial backgrounds add vitality and different perspectives to creative processes. Many Michigan companies are seeking to diversify their workforce for practical benefit, especially as they expand global reach. Embracing diversity has both an economic and social equity benefit. As the U.S. population becomes more ethnically and racially diverse, so do opportunities for entrepreneurship and small-business development with minority populations. Further, the cultural and long-run economic benefits to be gained by courting the many foreign students who pass through Michigan, could include long-term, cross-country joint venturing by small and midsize businesses. Michigan could do much more to court its foreign students as future partners in a "flat" world.

In a similar fashion, age need not be a barrier to entrepreneurship. Both young and old are part of the potential pool of budding entrepreneurs. In particular, Michigan could benefit from a coordinated and concerted effort to foster entrepreneurship among the following promising

age groups: youth, young adults (especially those completing college), mid-career workers looking for their next challenge in life and workers nearing retirement.

A key catalyst for entrepreneurship is education. Compared with several other states, Michigan's educational institutions have further to go in forming tighter linkages with industry and regional groups to foster entrepreneurial thinking and stretch creative expression.

More entrepreneurship programs in two- and four-year colleges deserve thoughtful exploration. Despite the pioneering leadership of Eastern Michigan University, Central Michigan University, Lawrence Technological University and the Michigan Entrepreneur Education Network, Michigan currently trails other states in terms of entrepreneurial degree programs at colleges and universities. Entrepreneurial education is an essential component of a robust entrepreneurial economy and needs to be a clear priority for the state. An example of progress in this area would be nationally recognized degree programs at colleges and universities.

4. **Strategic Intelligence for Small and Midsize Enterprises:** In business, information and "intelligence" are as important as financial capital. Michigan can make headway against its competitors if it more aggressively supports access to information for small and midsize companies.

Small and midsize businesses need access to affordable strategic information—information on emerging technologies, growing markets, competitor strategies, talent pools, and the like. Government can help with the creation, retention and expansion of early-stage and second-stage companies by providing and subsidizing information resources. Michigan's college-, university- and public-library business information resources are underutilized. A useful framework for getting strategic information to the small and midsize firm is the economic gardening approach pioneered more than 10 years ago in Littleton, Colorado. The economic-development function of Littleton is 100 percent directed at helping small and mid-size businesses gain access to the kinds of competitive intelligence and marketing information available at large companies. The program has had continued strong support from the Littleton business community.

4. **Incentives for Innovation-Based Collaboration:** Michigan needs to become a world leader in the linking of commercial enterprise with university-based discoveries.

In 2005 the U.S. Small Business Administration and the Edward Lowe Foundation co-sponsored a significant study, "The Innovation-Entrepreneurship Nexus," a national assessment of the contributions innovation and entrepreneurship make to regional economic growth and development. The findings indicated that Michigan lacked strong linkages between innovation and commercialization. Overall, key findings from the study were the following:

- Regions with innovation capabilities may not necessarily present high growth.
- High growth is related to the connection between innovation and entrepreneurship.
- Entrepreneurial vitality is a critical component of economic prosperity.

While considerable attention has been given to building Michigan's capacity in both research and development and, to a lesser extent, entrepreneurship, the Nexus study findings draw attention to linking the two. Such a linkage would result in more deals for venture

investors, rapid transfer from discovery to application, higher productivity and higher levels of worker knowledge and skills, and higher profits and wages.

States and regions that are building a strong, productive nexus between innovation and entrepreneurial activity appear to understand how the two synchronize and reinforce each other. To move forward in this area, the state may need to develop new perspectives on the issue. Here are two examples of practical, if possibly unconventional, approaches:

- Reward universities and colleges for deriving substantially more of their annual revenues from the sale or licensing of technology to Michigan companies.

- Advance university department eminence through partnerships with business alliances, where the income taxes generated by joint university-business ventures can be returned to the originating department for ongoing research and graduate-student stipends.

6. **Incentives for Risk-Capital Formation**: The lifeblood of first- and second-stage entrepreneurial companies is capital. While much progress has been made of late in improving access to capital for certain targeted segments of the Michigan economy (life sciences, for example), there continues to be a need for a *dramatic* improvement in how Michigan first- and second-stage entrepreneurs access capital for the research, development and/or commercialization of breakthrough technology, process and product innovations.

   Michigan should consider creating increased incentives for private-seed and mezzanine financing (with return on investment criteria clearly articulated). Michigan now has a number of financing vehicles for furthering the growth of risk capital, from seed and angel capital to formal venture capital. As with other Midwest states, the venture-capital industry now tends to focus on later-stage growth. Michigan's challenge is to formalize or expand a growth-from-within network of early-stage financing. Consequently, going forward, further attention might be placed on localized seed pools and angel capital networks, using an investment tax credit.

7. **Research and Development and Innovation in Small Business**: Michigan would do well to dedicate itself to becoming a national leader in securing SBIR and STTR grant awards for commercially viable projects.

   Much discussion ensued from last year's *Score Card* regarding SBIR, STTR and SBIC[1] metrics. Many thought Michigan's access to these federal programs was satisfactory. Indeed federal funding to Michigan has been increasing, but on a comparative basis, Michigan lags well behind the national average on SBIR and STTR awards. Most important, Michigan does not actively use incentives to encourage SBIR and STTR projects that have demonstrated commercial merit. The commercialization success of SBIR and STTR grants awarded in the state have little economic development impact.

   Ways to ramp up Michigan's access to these federal resources include: prioritizing these programs; screening more aggressively for scientific, technical and commercial merit; and fostering stronger small-business-university SBIR/STTR collaborations by rewarding commercialization alliances between manufacturers, investors and SBIR/STTR firms.

[1] Small Business Innovation Research (SBIR); Small Business Technology Transfer Research (SBTTR); Small Business Investment Companies (SBIC)

8. **Transferable Research and Development Tax Credits:** This approach has moved up on the agenda of several states.

   While many states are seeking to make their research and development tax credits permanent, technology businesses seldom benefit because they have little state tax liability. A potential remedy for this issue is granting *transferable research and development tax credits* to small firms based on the value of their research and development expenditures. The tax credit would be "cashed in" when the small firm transfers it to a commercialization partner (investor, Michigan manufacturer) that has a tax liability. The tax credit would, in turn, offset a commercialization partner's costs associated with launching a new product based on the successful research and development results.

9. **Business-to-Business Networks:** Michigan could be more aggressive in creating robust business alliances, CEO peer groups and consortia for solving competitive challenges.

   Businesses learn from each other and increase their productivity and efficiency through networking. There is mounting anecdotal evidence that peer learning is a particularly powerful vehicle for creative adaptation and change, especially among growth companies. In fact, growth companies are characterized by more frequent and intense CEO and senior-executive networks than their slower-growing counterparts. Peer-to-peer entrepreneur networks operate at a relatively low-key level in Michigan, as elsewhere. Some are sector based; others are geographic specific. Some are affiliated with national private or nonprofit organizations; others are independent and homegrown. (Nationwide listings are available at www.edwardlowe.org, the Edward Lowe Foundation Web site.)

   Tools that support effective networks are available, such as the PeerSpectives® Roundtable System. State government could help with modest matching grants to support such groups in their early stages. Legislation could create a small business alliances fund, which would provide state matching funds to support the startup of interfirm collaboratives supporting such purposes as research, training, marketing, and generic technology development.

10. **Entrepreneurial Impact Statement:** Michigan has a regulatory legacy whereby most regulations, rules and business incentives were designed around the needs of large durable-goods manufacturers, principally automotive companies. An entrepreneurial economy requires regulations, rules and business incentives that reflect the needs of first- and second-stage entrepreneurs. Toward this end, the state should seriously consider enacting a new Entrepreneurial Impact Statement regulation that would require the state to review rules and regulations with regard to their positive and negative impact on first- and second-stage entrepreneurs.

11. **Greening the Entrepreneur:** Rising energy and environmental costs are driving a robust worldwide market for green technologies, products and processes. As a durable goods manufacturing state, Michigan is well positioned to become a market leader in rapidly emerging green markets. Michigan currently exports more than $19 billion annually to pay for the importation of more than 95 percent of its energy. Energy efficient and environmentally sound technologies, products and processes would not only reduce this burden but also create new economic activity. That Michigan can improve in this area is shown, in part, by *Score Card* rankings of 30th in energy costs and 31st in renewable energy.

But rapidly growing green entrepreneurial companies, or "green gazelles," in Michigan that could lead this market growth face two important barriers:

- Traditional barriers that all first- and second-stage entrepreneurs face.
- A patchwork quilt of regulatory and financial disincentives.

Michigan can clearly identify those parts of its economy that would benefit from diversification into new green markets and target entrepreneurial incentives accordingly. For example, a Renewable Energy Portfolio Standard (RES) could be a boon to a new bio-based industry by linking Michigan's strong agricultural and industrial systems. Michigan is also well suited to manufacture and sell new energy-efficient products. Finally, Michigan has the potential to become a world leader in the manufacture of hydrogen vehicles and related technological innovations.

These strategies would require a much improved profile and mobilization of entrepreneurship effort in Michigan. None are big-ticket state budget items. None call for more centralized state bureaucracy. To the contrary, the secret to fostering an entrepreneurial economy is decentralizing opportunities, by empowering the adventuresome spirit with a competitive business climate and sound public infrastructure, along with small incentives to help get things started, whether they be local angel networks, business CEO roundtables or college curriculum changes that feature entrepreneurship. What is required in substantial amounts is a change of attitude and outlook about how the state will grow fast again and how it aspires to become a leading entrepreneurial state in the Midwest.

Context, Progress And Opportunities

Entrepreneurial Business Growth in Michigan
Progress and Opportunities 2004–2006

Entrepreneurial Business Growth in Michigan

American entrepreneurship and the entrepreneurial American economy are the envy of the world because they constitute a tremendous competitive advantage for the United States. In the same way, entrepreneurship and entrepreneurial economies *could be* tremendous competitive advantages for individual states; however, they are for surprisingly few states.

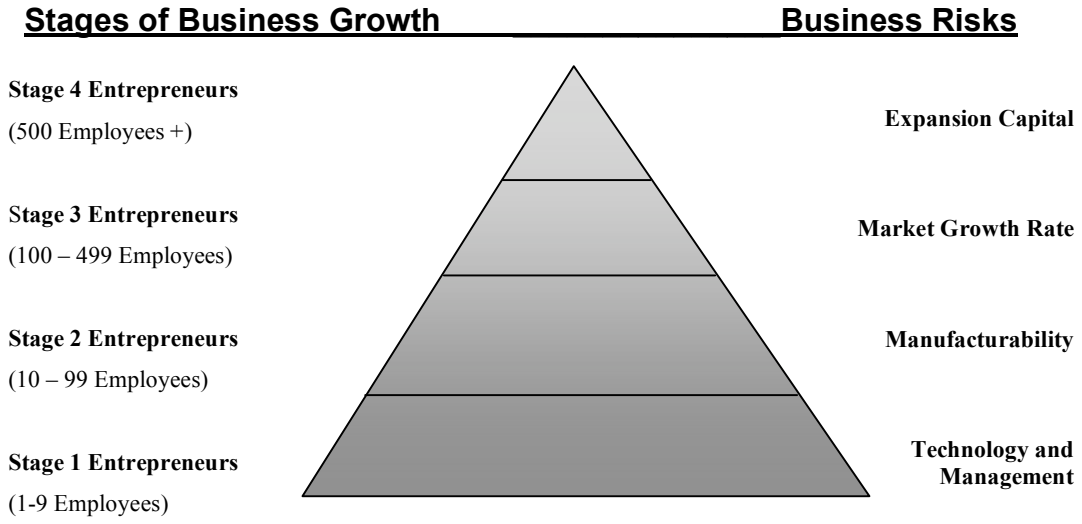
Insight: Few states are doing a superior job—or even a good job—of developing entrepreneurial economies for competitive advantage. In this year's *Score Card*, for example, only 11 states received A or B grades for Entrepreneurial Dynamism—the *Score Card*'*s* key measure of an economy's entrepreneurial health. Most received C's or D's; Michigan received a D.

Why does entrepreneurship matter? Since the late 1990s, research has shown that growing companies are the central driving force behind economic prosperity, growth and development. States with a large and increasing base of such companies have an economic advantage, especially in times of rapid change such as these. As the world "flattens" through technology, entrepreneurship will be more widely practiced outside of the United States, and sustaining a competitive advantage will become much more difficult. Staying ahead will depend largely on the ability of an economy to create an environment in which entrepreneurs and their growing companies can thrive. States that are currently behind face especially difficult challenges.

Stages of Entrepreneurship and Business Growth

An important outcome of research on economies has been a more refined and sophisticated understanding of the stages of business growth that entrepreneurs generally go through and the different, yet interrelated, challenges they face at each stage. For the most part, the challenges revolve around the risks associated with technology, management, product manufacturability, market-growth rate and expansion capital. In general, entrepreneurial business stages fall into four categories (with accompanying challenges) as illustrated in the following diagram.

First- and second-stage companies are particularly important to building and maintaining an entrepreneurial economy. First stage is a proving ground for business ideas and entrepreneurial talent. Second stage generates many of the net new jobs and is where companies prepare to become even larger, entering the third and fourth stages of growth.

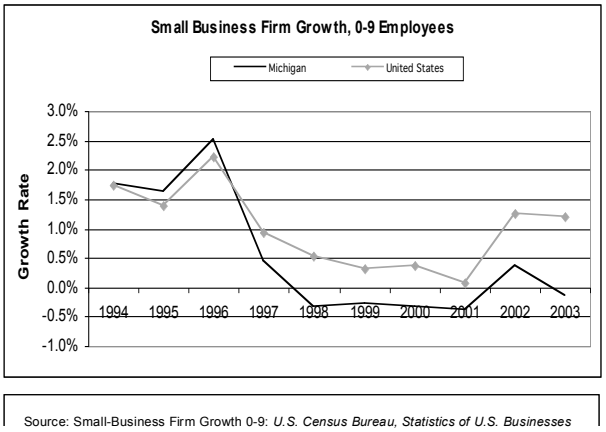


First-Stage Companies in Michigan

First-stage companies are generally considered to be early-stage companies with one to nine employees. They include startups with growth potential, microenterprises (proprietorships with fewer than five employees and limited access to resources for growth), and lifestyle maintenance companies not trying to grow. Their growth and performance are important indicators of the entrepreneurial vitality of an economy. Because first-stage companies fail at a relatively high rate, underperformance in this segment can be a substantial competitive disadvantage for an economy—as it is now for Michigan. Since the late1990s, Michigan has fallen short, sometimes significantly, in four important measures when compared with U.S. performance overall:

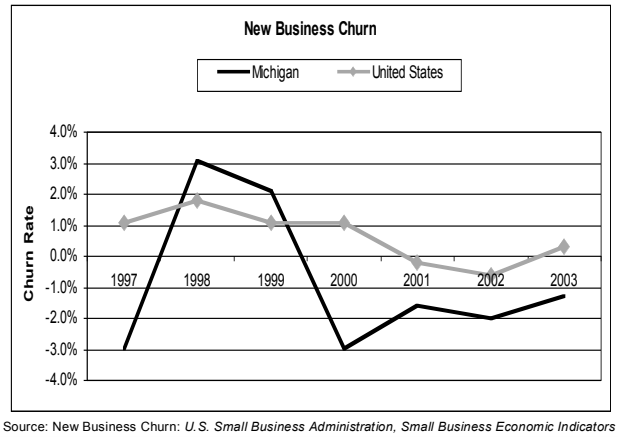
- Growth in firms with fewer than 10 employees.
- Numbers of nonemployer establishments (sole proprietorships/self employment).
- New business churn rate—the ratio of the number of net new businesses to the number of existing businesses.
- Growth in payroll.

These graphs show the trends for these areas.

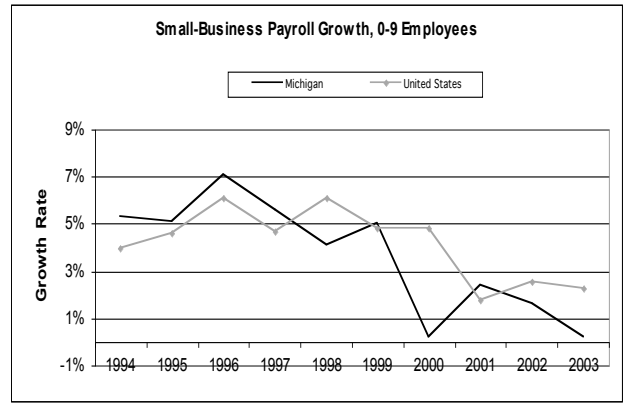


Source: Small-Business Firm Growth 0-9: *U.S. Census Bureau, Statistics of U.S. Businesses*

Source: Growth in Self-employment: *U.S. Census Bureau, Nonemployer Statistics*



Source: New Business Churn: *U.S. Small Business Administration, Small Business Economic Indicators*



Source: Small-Business Payroll Growth 0-9: *U.S. Census Bureau, Statistics of U.S. Businesses*

Second-Stage Companies and Growth

The true wellspring of an entrepreneurial economy is second-stage companies, which create new jobs and provide an economic engine for significant growth.

Second-stage companies, as identified and described by the Edward Lowe Foundation, have passed the volatile startup, or first stage and face issues of growth rather than survival. Their founders, owners or CEOs are moving from an entrepreneurial management style to a more professional approach that emphasizes formal organizational structure, specialization, delegation, and wider market penetration. Typically, they employ from 10 to 99 workers and have revenues between $1 million and $50 million. Though many second-stage companies are relatively young, not all are growth-oriented.

Those companies that possess both the *intent* and the *capacity* to grow comprise an influential segment known as growth companies. As measured by employment, revenue, and assets, these dynamic businesses grow from 10 percent to 15 percent per year, on average, over four years or more, researchers generally agree.

The 5 percent to 10 percent of employer firms that are high-growth companies are especially important because they are industry or market leaders that on average are strong job generators. They also:

- Create more well-paying jobs.
- Do more research and development.
- Provide more training.
- Export more than the average firm.
- Commercialize two to three new products each year.
- Incorporate two to three more technologies in their products than competitors.
- Bring their products to market in one-half the time.
- Compete in twice as many markets.

In addition, growth companies contribute to an economy's entrepreneurial dynamic in more subtle but important ways that affect a state's long-term economic well-being. They frequently partner with other firms in creative ways to generate new ventures, for example, and deepen local supply-buy linkages with other firms. (Preliminary research by the Small Business Foundation of Michigan has revealed that many second-stage entrepreneurs incubate first-stage companies in their facilities.) The more growth companies there are, the more likely there will be tight local and regional collaboration among firms.

CEOs and senior executives of growth companies network extensively, and such "peer networks" are becoming recognized as a key contributor to accelerated economic growth. Highly dynamic regional economic communities, such as California's Silicon Valley or Massachusetts' Route 128, can be attributed, in part, to the high degree of networking among top-level professionals and CEOs.

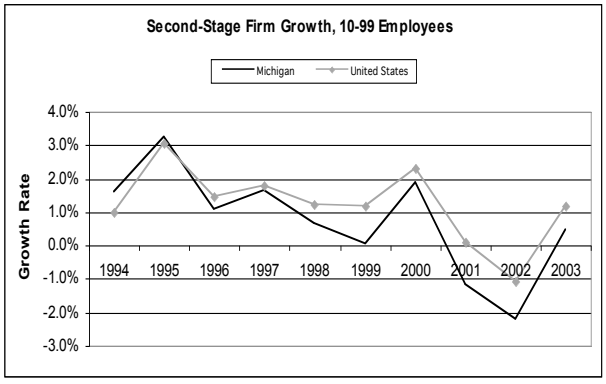
Second-Stage Companies in Michigan

Given the importance of second-stage entrepreneurs to sustained positive economic performance, Michigan's mixed 10-year record in the growth of second-stage firms is especially disturbing. Since the 2001 recession, especially, Michigan has scored below the U.S. average for job growth at second-stage companies.

Insight: Even though Michigan has a larger share of second-stage companies than most other states, those companies are growing at a slower rate. In 2003, Michigan had 40,898 second-stage companies, or 21.3 percent of all employer firms in the state, and between 1993 and 2003 they grew just 7.5 percent. On average during the same period, second-stage companies in all states made up only 19.7 percent of all employer firms, but grew 12.9 percent.

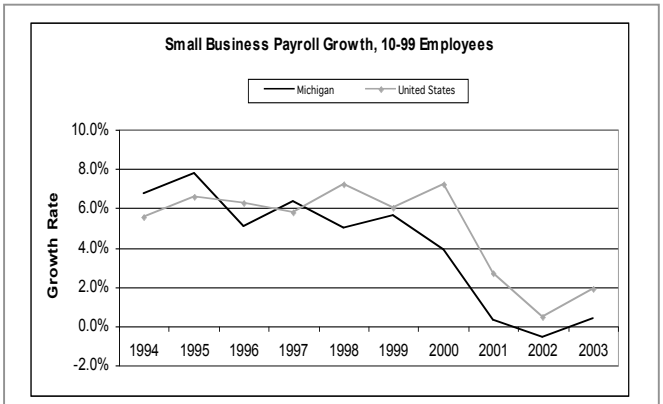
Just as Michigan's first-stage companies are underperforming on key indicators, so too are Michigan's second-stage companies. The state ranks in the middle among all states in small business employment and payroll growth. Its new business churn rate (business births minus deaths as a percentage of initial year establishments) in 2002-2003 for second-stage companies was -0.3% percent compared with the U.S. average of -0.2% percent. Payroll growth has also consistently underperformed. Between 1993 and 2003, however, Michigan's second-stage companies have grown faster than its first-stage companies, especially in number of firms and employment.

Second-Stage Firm Growth



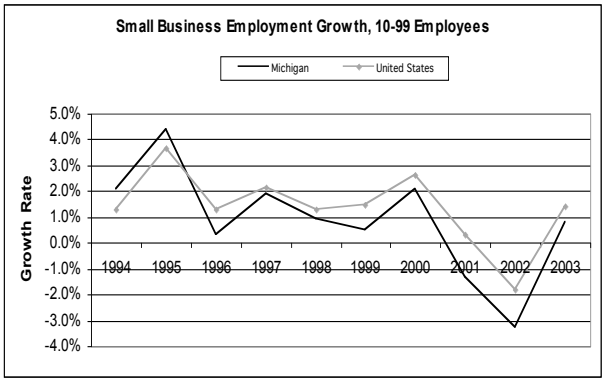
Source: Second-Stage Firm Growth 10-99: *U.S. Census Bureau, Statistics of U.S. Businesses*

Second-Stage Payroll Growth



Source: Second-Stage Payroll Growth 10-99: *U.S. Census Bureau, Statistics of U.S. Businesses*

Second-Stage Employment Growth



Source: Second-Stage Employment Growth 10-99: *U.S. Census Bureau, Statistics of U.S. Businesses*

Conditions for Growth

Michigan is underperforming on two important components of entrepreneurial dynamism: entrepreneurial vitality and entrepreneurial climate. (*See Key Findings 1: Primary Drivers*). Michigan has been doing particularly well in private lending to small business, a good sign. However, metrics on venture capital, university spinouts, high-performance firms, SBIR awards, and STTR awards show Michigan ranks at or below the national average. Michigan ranks 38th in its percentage of self-employed.

A recent study sponsored by the U.S. Small Business Administration points to another important policy angle from which to support small-business growth: Technology-intensive industries are more likely to produce small high-growth private businesses. That may be because small, high-growth companies can take exceptional advantage of industries requiring heavy investment in technology to develop new processes and products. Because small high-growth firms are an important link by which innovation and change are distributed in a regional economy, economic development and related public policy supporting technology become an important enabling mechanism, not only for these players but also for the entire economy.

> **Insight:** "If entrepreneurial companies are the source of new jobs and reinvestment in communities, failure to foster entrepreneurship… is simply an unacceptable policy choice."[3] *—The National Center for Entrepreneurship*

Innovation and Commercialization: The Nexus

Scientific discoveries are being made at an ever-increasing rate. American ingenuity reduces those discoveries to practice as new technology innovations, products and processes. But the linkage between innovation and commercialization is less than robust, according to the Innovation-Entrepreneurship NEXUS, a study sponsored by the U.S. Small Business Administration.[4] While the SBA NEXUS study does not present scores by state, Michigan regions rank relatively poorly in the study's regional entrepreneurship index.[5] Michigan universities receive close to $1 billion in federal research grants each year, but only a small percentage of the successful research is transferred to industry. (The *Score Card* ranks Michigan 27th in federal Small Business Innovation Research grants, which fund applied research projects with commercial potential. Michigan ranks 25th in university spinouts and 18th in university licensing/options to small business.)

Insight: Michigan's regions do not display a tight linkage between innovation and entrepreneurship. *But the building blocks are there for Michigan to move forward*.

The NEXUS study also shows that Michigan produces discoveries and inventions. What's missing is their rapid translation into viable enterprises. Given Michigan's extensive network of universities and technology-intensive industries, both a number 1 ranking for industry research and development and a number 20 ranking for university research and development indicate a strong discovery side of the equation. Further, Michigan ranks 11th in patents per worker. Also, capital investment in manufacturing is about at the U.S. midpoint. States that prosper will be those that foster both formal and informal networks among researchers, inventors, investors and owners of new or growing enterprises to expedite flow through the pipeline from discovery to commercial application.

---

[3] National Commission on Entrepreneurship, Embracing Innovation: Entrepreneurship and American Economic Growth, April, 2000, pp 10.

[4] "The Innovation-Enterpreneurship NEXUS: A National Assessment of Entrepreneurship and regional Economic Growth and Development" U.S. SBA, Office of Advocacy, April 2005.

[5] The index includes rankings on Average Annual New Firm Births per 1,000 Labor Force (1990-2001), Average Annual Change in New Firm Births (1990-2001), and Percent of Firms Growing Rapidly (1991-1996).

Progress and Opportunities 2004–2006:
A Qualitative Look at Entrepreneurship in Michigan

New to this edition of the *Score Card*, this section is designed to highlight tangible progress and related opportunities advancing entrepreneurship in the state since quantitative data were collected for this year's *Score Card.* The progress and opportunities reported here cover, roughly, the time period from January 2004 through December 2005 and provide qualitative insights and information that complement the *Score Card's* 126 metrics. This section offers an informative, though admittedly incomplete, view of progress toward building and maintaining an entrepreneurial business culture in Michigan.

Individuals representing a select group of public- and private-sector organizations with an interest in entrepreneurship and economic development in Michigan were surveyed in mid-February. Their responses form the basis for this report, but those responses are necessarily condensed, combined or paraphrased. (*See Appendix 7 for methodology and a list of respondents*.) Legislation affecting Michigan's progress toward entrepreneurial economy is also discussed, but is not based on survey responses.

Relevant Themes and Success Stories

Participants identified three themes, or challenges, related to building an entrepreneurial economy in Michigan:

- Strategic Priorities and Choices
- Collaborative Development
- Entrepreneurship Education

Respondents also provided examples, or success stories, in connection with those themes. Selected success stories and comments from participants are provided on the following pages.

Theme 1: Strategic Priorities and Choices

The evolution of entrepreneurship-related policy and programs in Michigan suggests a growing desire to cultivate the four major factors of economic growth: innovation, human capital, investment capital and entrepreneurship.

> **Resource Success Story: Michigan Microenterprise Coalition (MMC)**
> MMC was established in 2005 as an entrepreneurship support association committed to maximizing the impact of state microenterprise funding by improving the capacity and delivery of services designed specifically for emerging enterprises. MMC's purpose and structure is modeled on the best practices of similar state associations. It will serve nine different geographical areas of the state by virtue of its affiliation with the Community Economic Development Association of Michigan (CEDAM).

Investment Success Stories: SBA Loan Program and SMF Venture Fund

The SBA's small-business-loan program in Michigan increased 50 percent during fiscal 2005. This increase dramatically exceeded the SBA's loan projections for the state and helped the agency fulfill its primary goal of providing the capital small-business owners need to start and grow businesses.

The year 2005 also proved fruitful for venture-capital development. The new Southwest Michigan Life Science Venture Fund, managed by Southwest Michigan First (SMF) of Kalamazoo, raised $50 million dollars from regional investors. The fund will target investment in life-science startups and is scheduled to make its first investment by the second quarter of 2006. The fund's management hopes not only to generate a return for investors but also to create new companies, new jobs and a larger the tax base for the region.

Comments

"Building a successful entrepreneurial culture is hard. To thrive, an entrepreneurial culture needs many things. These include easy and low-cost access to talent, capital, local customers, back-office support and flexible suppliers. In addition, most entrepreneurs are inexperienced at entrepreneurship and must be able (and willing) to learn a lot from others. Yet, as Michigan's many entrepreneurial experiments amply demonstrate, these tactics usually cannot be implemented effectively without an overall strategy that is coherent, compelling, consistent and funded."

—Shepherd Advisors

"The Small Business Association of Michigan Entrepreneurial Development Center actively lobbies for such public policies as a transferable research and development tax credit, entrepreneurial impact statements for new regulations and entrepreneurial degree programs at Michigan's colleges and universities. The organization advocates for public policies that foster the robust creation, retention, expansion and attraction of first and second-stage entrepreneurial businesses."

—Small Business Association of Michigan Entrepreneurial Development Center

Theme 2: A Collaborative Model for Development and Delivery

Respondents were in general agreement that the breadth and complexity of the challenge involved in integrating entrepreneurship and conventional economic development practices demanded a new and more fluid operational model.

Measurement Success Story: *Entrepreneurship Score Card* 2004–2005

The Small Business Foundation of Michigan (SBFM), in concert with the Small Business Association of Michigan (SBAM), conceived, created and launched a new research tool designed to benchmark and monitor the status and progress of entrepreneurship in Michigan. This new tool proved to be of critical importance in framing policy discussion for the state regarding small business, entrepreneurship and overall economic-development policy. That discussion, in turn, launched significant cross-departmental dialogue regarding related programs and initiatives still under development.

Recognition Success Story: Michigan 50 Companies to Watch 2005

This inaugural *50 Companies to Watch*[SM] *in Michigan* awards program was the first in the nation to celebrate second-stage companies for the vital role they play in the economy of a state. Most second-stage companies as identified and described by the Edward Lowe Foundation, have $1 million to $50 million in annual revenue and from 10 to 99 employees. Second-stage companies are a vital source of net new jobs. Their products and services also cause new dollars to flow into and through Michigan's economy. The first event for this program was a collaborative effort among several organizations, in addition to the Edward Lowe Foundation, under the banner of Michigan Celebrates Small Business: the Michigan Small Business and Technology Development Center, the SBA Michigan District Office, the Small Business Association of Michigan, and the Michigan Economic Development Corporation.

Collaboration Success Story: IncuMentoring in Michigan

For about a year, Online Technologies Corp. (OTC) has been helping startup Internet companies with workspace, technology and mentoring. Four senior managers were coaches and mentors for numerous startups before joining OTC and, once there, found additional resources to share with Internet startups. This grew organically into an Internet incubator.

Comments

"A number of state departments, including DLEG, Treasury, Community Health and Transportation have come together to develop comprehensive programs for economic development and growing entrepreneurship."

—Michigan Department of Labor & Economic Development (MDLEG)

"While these synergistic partnerships are valuable and generally useful, they do not have as much impact on the ultimate success or failure of a startup company as one might expect. The reasons for this are complex. They center around the very nature of entrepreneurship and opportunity selection."

—North Coast Technology Investors

"The greatest synergies should be in the area of commercialization, but very few organizations are staffed with people who have relevant experience or skills for this work."

—IdeaWorks, LLC

"Release of the first *Entrepreneurship Score Card* fostered several important changes for economic developers throughout the state. (There has been) a shift in thinking and action among organizations serving entrepreneurs, including:

- Better networking and collaboration among organizations;
- Closer ties between research and development and commercialization efforts;
- Evolution of entrepreneurship as an academic discipline;
- Greater efficiency in delivering services to customers;
- Recognition of entrepreneurship as a catalyst for transforming the economy."

—Michigan Small Business and Technology Development Center

Theme 3: Education and Entrepreneurship

When respondents considered education for entrepreneurship, they tended to see it as a key skill-building capability that entrepreneurs needed in orderto navigate the changing economic landscape intrinsic to growing a business.

Education Success Stories:

- Michigan Entrepreneurship Education Network
  In 2005 MEEN, a collaborative effort of CyberMichigan, the University of Michigan and the Michigan Economic Development Corporation, expanded its service offering and improved its capacity to provide technology-enabled entrepreneurship education. This program, serving an expanded audience that now includes practicing and aspiring entrepreneurs, is based on its assessment of best practices currently offered by university level entrepreneurship programs throughout the nation.

- Three Universities: Centers of Opportunity

  At Central Michigan University's LaBelle Entrepreneurial Center, an advisory board of 13 entrepreneurs helps to direct the center and, coupled with a committee of business faculty members, uses an innovative approach to entrepreneurship education.

  With an emphasis on entrepreneurial management for startups and new business development in established companies, Lawrence Technological University's Lear Entrepreneurial Center sharpens business, teamwork and industry specific technical skills for use in challenging entrepreneurial environments.

  A recipient of a 2006 Keen Foundation grant, the University of Detroit-Mercy is developing entrepreneurial curricula and programs in the backyard of the traditional industrial economy.

CEO Learning Success Story: PeerSpectives® Roundtable System

In the fall of 2005, the Michigan Small Business and Technology Development Center began implementing an innovative peer-learning program designed for busy and demanding entrepreneurs whose companies are in the second stage of growth. Designed by the Edward Lowe Foundation, PeerSpectives Roundtables help entrepreneurs learn from each other in a professionally facilitated, confidential environment that serves their particular time and information-gathering needs. Michigan is at the forefront in helping entrepreneurs in this way, being one of the first states to implement the program.

Comments

"The Zell Lurie Institute for Entrepreneurial Studies at the University of Michigan has historically focused on imparting entrepreneurial skills, primarily to MBA students. We do this by a combination of courses and action-based learning programs. These action-based learning programs engage real companies or entities hoping to become companies."

—Zell Lurie Institute for Entrepreneurial Studies

"Research shows that most Michigan counties lack sufficient numbers of small start-ups for optimal job and income growth. Our initiative on community-based entrepreneurship will help participating communities learn how to rebalance their economies for sustainable future growth."

—Michigan State University Extension Service

New Legislation

Although not addressed specifically by either the *Score Card* or the "Progress and Opportunities" survey, certain legislation enacted in 2005 promises to have a positive effect on Michigan entrepreneurs and the state's entrepreneurial environment. In fact, several new state government programs speak to issues of concern to the survey respondents. Especially encouraging to proponents of an entrepreneurial economy was legislation that encourages and helps to finance new business activities.

Four programs enacted in 2005 should prove beneficial:

1. *Competitive-Edge Commercialization Program:* Encourages technological transfer—that is, moving research and development results out of laboratories and into the marketplace. New business activity encouraged by the program includes: University Spinoffs, SBIR Awards, STTR Awards, NSF Funding Rate, SBIR Financing, STTR Financing.

2. *Capital Investment Program:* Encourages funding new business activity with venture capital.

3. *Commercial Lending Program:* Encourages banks to finance more new business ventures.

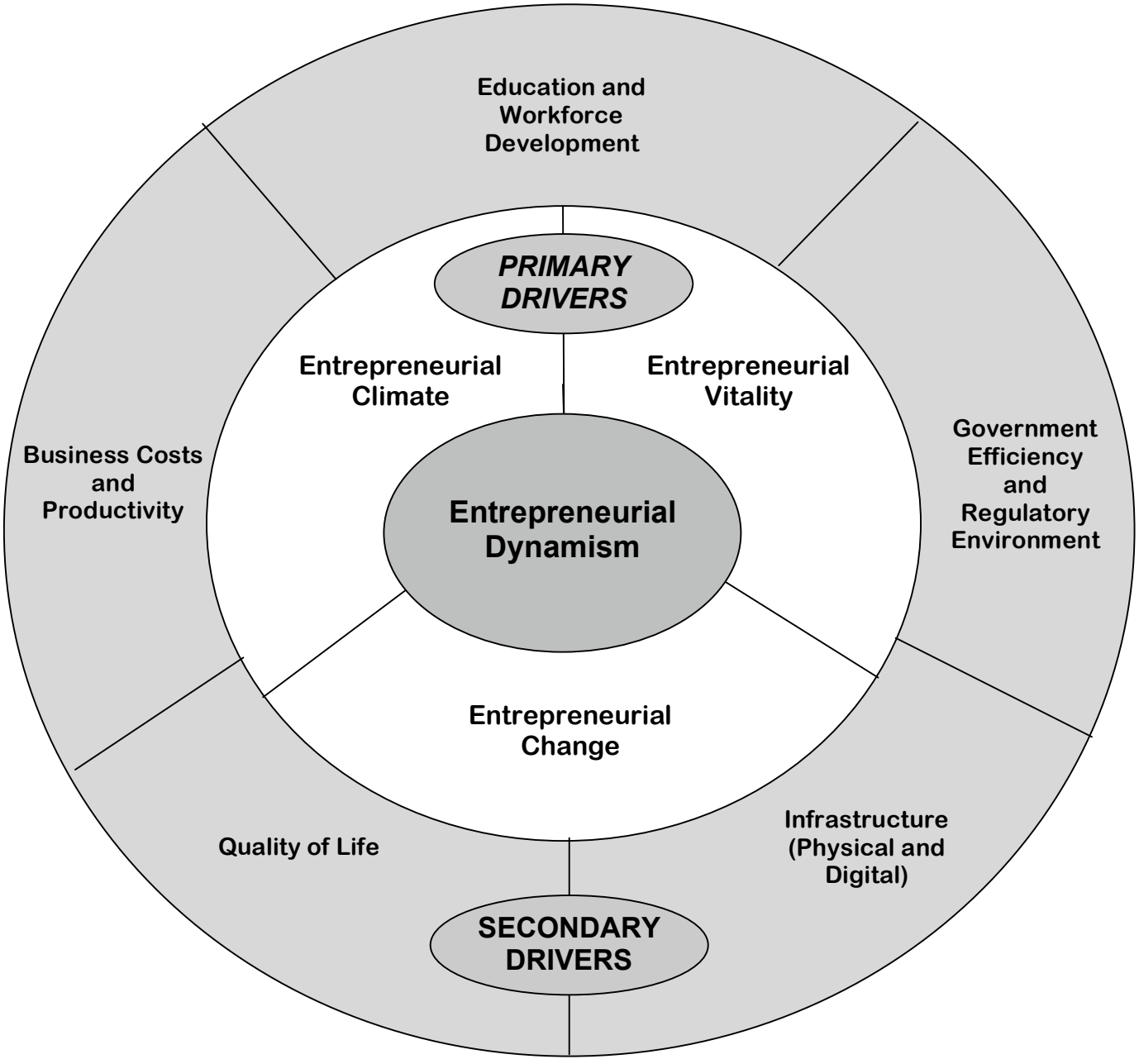
4. *Jobs for Michigan Investment Fund*: Allocates new resources to encourage technology ventures.

In addition, the *Michigan Early Stage Venture Capital Investment Fund* was established through a 2003 legislative act. Money from the fund will be invested in venture-capital companies to promote investment in desirable businesses and should have a positive effect on venture-capital activity in Michigan in 2007.

Appendices

Appendix 1: Factors Influencing Entrepreneurial Dynamism

Measured by *The Entrepreneurship Score Card*



Entrepreneurial Dynamism is the key outcome measured by the *Score Card* and is comprised of three primary drivers: Entrepreneurial Change, Entrepreneurial Vitality, and Entrepreneurial Climate.

Five secondary drivers influence progress toward an entrepreneurial economy: Education and Workforce Development, Business Costs and Productivity, Government Efficiency and Regulatory Environment, Infrastructure, and Quality of Life. 126 separate metrics determine *Score Card* results. See Appendix 3 for a complete list.

Appendix 2: Michigan Performance: All Metrics

Entrepreneurial Dynamism Grade: D	Most-Current Year		Current Year –2		Current Year–4	
	Ranking	Rating	Ranking	Rating	Ranking	Rating
Entrepreneurial Dynamism *(Index)*	**31**	**		*		*
Entrepreneurial Change	**44**	**		**		*
Growth in Number of Small Businesses	46		46		39	
Increase in High-Performance Companies	28		5		21	
New Business Churn Growth	22		22		5	
Small Business Payroll Growth	48		48		50	
Nonwage Income Per Capita Growth	28		8		16	
Entrepreneurial Vitality	**28**	*		*		*
New Business Churn	27		27		29	
Self-employment	38		38		45	
University Spinout Businesses	25		25		22	
High-Performance Companies	18		15		19	
IPO Awards	24		26		28	
SBIR Awards	27		26		27	
STTR Awards	12		33		21	
SBIC Awards	31		22		26	
Entrepreneurial Climate	**25**	**		**		*
Ideas and Innovations	27	**		*		**
Small Businesses University Licenses/Options	18		15		18	
University Research and Development	20		20		22	
Patents	11		11		10	
Patent Productivity	36		38		39	
NSF Proposal Funding Rate	15		26		26	
SBIR Funding Rate	29		41		38	
Financial and Institutional Capital	**20**	**		*		*
Venture Capital Financing	27		30		37	
IPO Financing	10		26		28	
SBIC Financing	37		34		30	
SBIR Financing	30		21		28	
STTR Financing	20		24		23	
Bank Commercial and Industrial Lending	11		11		10	
Private Lending to Small Business	6		6		9	
Business Incubators	38		38		47	

General Growth	**22**	**		**		**
Gross State Product Growth	50		46		48	
Fortune 500 Headquarters	8		7		8	
Capital Investment Growth in Manufacturing	19		19		33	
Foreign Direct Investment Growth	5		5		48	
Export Growth	34		42		23	
Large Business Payroll Growth	39		39		49	
Building Permits	34		33		25	
Industry Research and Development	1		1		2	
Federal Research and Development	40		40		41	
University Royalty/License Income	9		8		7	
Entrepreneurial Cohort	27		25		21	
Net Migration Rate	42		42		33	
Education and Workforce Development	**8**	***		***		***
K-12 Education	**24**	****		****		***
AP Overall	27		23		24	
High School Graduation Rate	10		10		17	
SAT	14		14		13	
ACT	18		25		29	
NAEP Mathematics	27		25		8	
NAEP Reading	29		26		37	
Postsecondary Education	**6**	***		****		****
Associate's Degrees Granted	25		21		22	
Bachelor's Degrees Granted	21		20		22	
Graduate Degrees Granted	10		8		8	
Physical Sciences and Engineering Degrees	12		14		16	
Technologist and Technician Degrees	22		24		25	
Other Innovation Degrees	6		7		5	
Two-Year Tuition	22		26		31	
Four-Year Total Fees	38		42		40	
U.S. News Undergraduate Reputation	22		20		(n/a)	
Top-Ranked New Economy Graduate Programs	7		6		(n/a)	
Other Ranked Graduate Programs	5		5		(n/a)	
College Migration	44		44		32	
Entrepreneurial Programs and Curricula	35		(n/a)		(n/a)	
Workforce	**13**	***		***		**
High School Diploma Attainment	23		21		21	
Bachelor's Degree Attainment	30		28		31	
High-Tech Manufacturing Employment	1		1		1	
High-Tech Services Employment	14		13		13	
Physical Sciences and Engineering Workers	9		12		14	
Technologist and Technician Workers	23		32		29	
Other Innovation Workers	25		32		39	
Adult Education	12		10		11	

Business Costs and Productivity	**37**	***	***		**
Business Costs	**44**	**	*		*
Unit Labor Costs	44		44		49
Energy Costs	30		30		(n/a)
Workers' Compensation Costs	22		21		29
Unemployment Insurance Costs	40		34		32
Business Tax Burden	15		30		19
State Business Tax Structure	49		50		(n/a)
Metro Office Rents Index	29		29		26
Small Business Health Care Premiums	34		34		31
Productivity	**19**	***	***		**
Gross State Product Per Job	17		14		14
Value Added in Manufacturing Per Hour	22		22		31
Service Industry Gross State Product Per Job	21		21		20
Government Efficiency and Regulatory Environment	**13**	***	***		****
Government Efficiency	**23**	****	****		*****
Government Gross State Product	26		26		27
Units of Government Per Capita	22		22		20
State and Local Tax Burden	29		26		23
Regulatory Environment	**16**	****	***		***
Malpractice Costs	46		48		49
Health Mandates	8		5		5
Business Liability	13		13		20
Liability Systems	24		29		(n/a)
Local Phone Competition	3		3		8
Infrastructure	**42**	**	**		***
Physical Infrastructure	**37**	**	**		***
Highway Quality	45		45		48
Bridge Quality	31		31		37
Railway Productivity	13		13		14
Major Air Market Access	24		23		25
Traffic Congestion	30		30		29
Digital Infrastructure	**42**	**	**		***
Broadband Infrastructure	30		27		18
Next Generation Internet	39		38		40
Rural Online – Last Mile Internet	22		23		19
Technology in Schools	15		18		26

Quality of Life	**33**	***	***	****
Economic Indicators	**25**	****	****	*****
Urban Cost of Living	31		33	37
Urban Housing Affordability	28		26	27
Homeownership Rates	4		5	1
Unemployment Rate	48		47	38
Involuntary Part-Time Employment	25		25	28
Government Assistance	17		17	11
Per Capita Disposable Income	21		18	19
Health	**17**	****	***	****
Lack of Health Insurance	12		9	17
Per Capita Public Health Spending	29		29	25
Occupational Fatalities	10		10	11
Limited Activity Days	28		28	23
Environmental Quality	**30**	****	***	****
Clean Air	45		39	34
Toxic Release Inventory	21		21	25
Renewable Energy	31		31	31
Municipal Waste Recycled	22		24	35
Water Quality	6		1	6
Public Safety	**36**	**	**	**
Violent Crime Rate	34		37	38
Total Property Crime Rate	20		20	25
Law Enforcement Personnel	39		33	32
Leisure and Entertainment	**34**	**	*	**
Arts and Culture Employment	41		42	43
Recreation Employment	26		27	18
Sports Employment	19		19	16
Outdoor Recreation	**35**	*	*	**
Parkland	18		18	18
Golf Courses	27		26	26
Trails	40		39	35
Diversity / Equity	**35**	***	**	***
Gender Equity	27		27	26
Racial/Ethnic Equity	20		20	16
Hate Crimes	48		43	34
Rural-Urban Disparity	13		12	(n/a)
Civic Energy	**28**	***	**	**
Number of Nonprofits	35		36	35
Charitable Giving	20		22	21
Voter Turnout	17		14	14

Appendix 3: Score Card Structure Listing of Metrics

Structure and Metrics Summary

OVERVIEW

Entrepreneurial Dynamism

Primary Drivers

- Entrepreneurial Change
- Entrepreneurial Vitality
- Entrepreneurial Climate

Secondary Drivers

- Education and Workforce Development
- Business Costs and Productivity
- Government Efficiency and Regulatory Environment
- Infrastructure
- Quality of Life

Key Measure:
Entrepreneurial Dynamism

Primary Drivers

Entrepreneurial Change

Metrics

- Growth in Number of Small Businesses
- Increase in High-Performance Firms
- New Business Churn Growth
- Small Business Payroll Growth
- Nonwage Income Per Capita Growth

Entrepreneurial Vitality

Metrics

- New Business Churn
- Self-Employment
- University Spinout Businesses
- High-Performance Companies
- IPO Awards
- SBIR Awards
- STTR Awards
- SBIC Awards

Entrepreneurial Climate

Metrics

Ideas and Innovations

- Small Businesses University Licenses/Options
- University Research and Development
- Patents
- Patent Productivity
- NSF Proposal Funding Rate
- SBIR Funding Rate

Financial and Institutional Capital
- Venture Capital Financing
- IPO Financing
- SBIC Financing
- SBIR Financing
- STTR Financing
- Bank Commercial and Industrial Lending
- Private Lending to Small Businesses
- Business Incubators

General Growth
- Gross State Product Growth
- Fortune 500 Headquarters
- Capital Investment Growth in Manufacturing
- Foreign Direct Investment Growth
- Export Growth
- Large Business Payroll Growth
- Building Permits
- Industry Research and Development
- Federal Research and Development
- University Royalty/License Income
- Entrepreneurial Cohort
- Net Migration Rate

Secondary Drivers:

Education and Workforce Development

Metrics

K–12 Education
- AP Overall
- High School Graduation Rate
- SAT
- ACT
- NAEP Mathematics
- NAEP Reading

Postsecondary Education
- Associate's Degrees Granted
- Bachelor's Degrees Granted
- Graduate Degrees Granted
- Physical Sciences and Engineering Degrees
- Technologist and Technician Degrees
- Other Innovation Degrees
- Two-Year Tuition
- Four-Year Total Fees
- U.S. News Undergraduate Reputation
- Top-Ranked New Economy Graduate Programs
- Other Ranked Graduate Programs
- College Migration
- Entrepreneurial Programs and Curricula

Workforce
- High School Diploma Attainment
- Bachelor's Degree Attainment
- High-Tech Manufacturing Employment
- High-Tech Services Employment
- Physical Sciences and Engineering Workers
- Technologist and Technician Workers
- Other Innovation Workers
- Adult Education

Business Costs and Productivity

Metrics

- Business Costs
  - Unit Labor Costs
  - Energy Costs
  - Workers' Compensation Costs
  - Unemployment Insurance Costs
  - Business Tax Burden
  - State Business Tax Structure
  - Metro Office Rents Index
  - Small Business Health-Care Premiums
- Productivity
  - Gross State Product Per Job
  - Value Added in Manufacturing Per Hour
  - Service Industry Gross State Product Per Job

Government Efficiency and Regulatory Environment

Metrics

- Government Efficiency
  - Government Gross State Product
  - Units of Government Per Capita
  - State and Local Tax Burden
- Regulatory Environment
  - Malpractice Costs
  - Health Mandates
  - Business Liability
  - Liability Systems
  - Local Phone Competition

Infrastructure

Metrics

- Physical Infrastructure
  - Highway Quality
  - Bridge Quality
  - Railway Productivity
  - Major Air-Market Access
  - Traffic Congestion
- Digital Infrastructure
  - Broadband Infrastructure
  - Next Generation Internet
  - Rural Online – Last Mile Internet
  - Technology in Schools

Quality of Life

Metrics

- Economic Indicators
  - Urban Cost of Living
  - Urban Housing Affordability
  - Homeownership Rates
  - Unemployment Rate
  - Involuntary Part-Time Employment
  - Government Assistance
  - Per Capita Disposable Personal Income
- Health
  - Lack of Health Insurance
  - Per Capita Public Health Spending
  - Occupational Fatalities
  - Limited Activity Days

Environmental Quality
- Clean Air
- Toxic Release Inventory
- Renewable Energy
- Municipal Waste Recycled
- Water Quality

Public Safety
- Violent Crime Rate
- Total Property Crime Rate
- Law Enforcement Personnel

Leisure and Entertainment
- Arts and Culture Employment
- Recreation Employment
- Sports Employment

Outdoor Recreation
- Parkland
- Golf Courses
- Trails

Diversity/Equity
- Gender Equity
- Racial/Ethnic Equity
- Hate Crimes
- Rural-Urban Disparity

Civic Energy
- Number of Nonprofits
- Charitable Giving
- Voter Turnout

Appendix 4:
Improving Entrepreneurial Dynamism in Michigan: Supplement

The scores of the primary drivers of Entrepreneurial Dynamism—change, vitality, and climate—cannot be influenced directly because they are composites based on 39 separate metrics. The 39 Entrepreneurial Dynamism metrics are listed below, with some notes on related local activity that has been in the news recently and options that might improve Michigan's performance. The details and options listed are neither comprehensive nor authoritative. They are starter ideas that should be supplemented by planners and decision makers who want to increase Michigan's Entrepreneurial Dynamism.

Each of the metrics also is labeled Easier or Harder, to indicate tentatively whether the measured factor is likely to be easier or harder to improve, based on two questions:

- Is it likely that the factor can be improved relatively easily using marketing or education programs?
- Is it likely that the factor can be improved by noncontroversial government policy or regulatory changes?

The Entrepreneurial Dynamism Metrics

Entrepreneurial Change Driver:

Growth in Number of Small Businesses – Harder

Increase in High-Performance Companies – Harder

Recent activity

- Michigan's new 21st Century Job Fund is expected to generate new technology-oriented businesses, and that should contribute to the proportion of rapid-growth companies. $1.4 billion to be raised by a bond issue to be paid off with future tobacco lawsuit settlement proceeds has been legislated for the 21st Century Jobs Fund, and $600 million in private investments is expected to round it up to $2 billion. The 21st Century Jobs Fund is described at http://www.michigan.org/medc/21stcenturytour/overview/index.asp.
- The PeerSpectives Roundtable Program being implemented in Michigan by the Small Business and Technology Development Centers to encourage successful small business owners to communicate and learn from one another is starting to contribute to business growth and success.

Options

- Stimulate more communication among companies with an information campaign.
- Encourage business establishment, business growth and business immigration across all industries, not just the high tech industries promoted in most of the of the 21st Century Jobs Fund programs.
- Enact a transferable research and development tax credit similar to those in other states, whereby the value of research and development performed by small businesses can be transferred to their commercialization investor/partners in the form of a tax credit. Such

tax credits offset commercialization startup costs and foster the development of new supplier relationships between technology developers and manufacturers.

- Similarly, enact a tax credit or other incentive that would reward large businesses for licensing to smaller companies the manufacture of products the large companies have researched and developed and then decided not to commercialize because they are focusing their marketing resources elsewhere.

New Business Churn Growth – Harder

Small Business Payroll Growth – Harder

Recent activity

- As the 21st Century Job Fund generates new technology-oriented businesses, the proportion of higher-pay professional and technical positions should increase.
- The increase in Michigan's minimum wage that was enacted in 2006 should improve this statistic, though some would argue that it is not in the best interests of business. On October 1, 2006, Michigan's minimum wage will increase from $5.15 to $6.95 per hour. It will increase again to $7.15 on July 1, 2007, and again to $7.40 on July 1, 2008.

Nonwage Income Per Capita Growth – Harder

Entrepreneurial Vitality Driver:

New Business Churn – Harder

Recent activity

- The financing available through the 21st Century Job Fund may improve the small company survival rate.

Options

- Encourage new business formation by supporting Junior Achievement programs and entrepreneurship courses and curricula at Michigan colleges.

Self-Employment – Harder

Options

- Encourage an entrepreneurial predisposition in Michigan youth by supporting Junior Achievement programs.
- Encourage establishment of new courses and curricula in entrepreneurship at two-year and four-year colleges.
- Encourage startups through a media information program.

University Spinout Businesses – Easier

Recent activity

- Up to $200 million legislated for Michigan's *Competitive-Edge Commercialization Program* established in 2005 should encourage more technology transfer.

Options

- Establish media information programs and targeted information programs that encourage technology transfer and offer guidance to college researchers and to entrepreneurs.

High Performance Companies – Harder

The activities and options listed under the second metric in this list, **Increase in High-Performance Companies**, all apply to this **High-Performance Companies** metric.

IPO Awards – Harder

The activities and options listed under the second metric in this list, **Increase in High-Performance Companies**, all apply to this **IPO Awards** metric; the more high-performance companies there are, the more IPOs there are likely to be.

SBIR Awards – Easier

Recent activity

- Up to $200 million was legislated for Michigan's *Competitive-Edge Commercialization Program* in 2005, and may be used to raise awareness of SBIR options.

Options

- Encourage college researchers and small business owners through direct-contact information campaigns to apply for SBIR grants so there will be more applications and fewer missed opportunities.

STTR Awards – Easier

The **SBIR Awards** comments immediately above apply equally to **STTR Awards**.

SBIC Awards – Easier

Options

- Establish an education campaign to encourage more banks to join the SBIC program.
- Establish an education program to make more small company owners aware that SBICs often provide funding at more favorable rates than other lenders or investors.

Entrepreneurial Climate Driver:

Ideas and Innovations Subdriver – Harder

Small Business University Licenses/Options – Easier

Recent activity

- The $400 million Jobs for Michigan Investment Fund and $200 million Competitive Edge Commercialization Program, both established in 2005, will encourage more linkages between college researchers and small businesses.

Options

- Establish an education program to remind researchers and small business owners that they have the option of a licensing arrangement for producing new products.

University Research and Development – Harder

Options

- Establish a program to promote awareness of research and development funding available to private industry that can be used to pay for university research with commercial applications. Awareness among university researchers already is high.

Patents – Harder

Patent Productivity – Harder

NSF Proposal Funding Rate – Easier

Recent activity

- The up-to-$200-million *Competitive-Edge Commercialization Program* established in 2005 will contribute to the college infrastructure for scientific research and development, so the future is likely to present more opportunities for NSF funding.

SBIR Funding Rate – Easier

Options

- The rate of SBIR-proposal success might decrease if the education program option listed above for the **SBIR Awards** metric results in more borderline SBIR proposals.

Financial and Institutional Capital Subdriver – Harder

Venture Capital Financing – Easier

Recent activity

- The $30 million Michigan Early Stage Venture Capital Investment Act passed in 2003 should start having a positive effect on VC investment in 2007.
- The up-to-$114 million *Capital Investment Program*, passed in 2005, calls for state investment in venture capital operations, and should increase their number and use.
- The programs enacted in 2005 to improve small business access to grants and loans will decrease the need for venture capital, and may worsen this statistic.

Options

- Establish an education program to help business owners prepare better VC proposals, and bring in more VC funding from out of state.

IPO Financing – Harder

Options

- Establish an education program on the benefits of local restricted securities offerings for both businesses and investors. Restricted offerings would increase equity investment in Michigan, but could hurt this statistic by relieving the need for IPOs.

SBIC Financing – Easier

Options

- Establish an education campaign to encourage more banks to join the SBIC program.
- Establish an education program to let more small company owners know that SBICs often provide funding at more favorable rates than other lenders or investors.

SBIR Financing – Easier

Recent activity

- The up-to $200 million *Competitive-Edge Commercialization Program* established in 2005 may raise awareness of SBIR options.

Options

- Establish a direct contact campaigns to encourage college researchers and small business owners to apply for SBIR grants.

STTR Financing – Easier

The **SBIR Financing** comments immediately above apply equally to **STTR Financing**.

Bank Commercial and Industrial Lending – Easier

Recent activity

- Michigan's up-to-$71 million *Commercial Lending Program* established in 2005 to enhance commercial loan programs will encourage financial institutions to offer more business loans.

Private Lending to Small Businesses – Harder

Business Incubators – Easier

Options

- Establish an information program to educate decision makers at economic development agencies regarding the value of incubators and best practices for their establishment and maintenance. Encourage them to advise local entities interested in establishing and running them.

General Growth Subdriver – Harder

Gross State Product Growth – Harder

The activities and options listed under the second metric in this list, **Increase in High-Performance Companies**, all apply to this **Gross State Product Growth** metric.

Additional option

- Encourage economic development organizations to maximize the benefits of their support to local companies through economic gardening programs.

Fortune 500 Headquarters – Harder

Capital Investment Growth in Manufacturing – Easier

Recent activity

- Easier financing from all three business-support acts passed in 2005 encourages manufacturers both to start up and to invest in new facilities.

- On the other hand, Michigan's Single Business Tax on companies with over $350,000 in receipts discourages companies from growing past that threshold.

Foreign Direct Investment Growth – Easier

Recent activity

- An investment tax credit has lightened the tax burden on business investment in Michigan from outside Michigan.

Options

- Market Michigan's friendliness to foreign direct investment to potential foreign investors, perhaps on a State of Michigan or a nongovernmental organization Web site.

Export Growth – Easier

Options

- Educate Michigan business owners about federal government programs to help small businesses start and succeed at exporting.

Large Business Payroll Growth – Harder

The activities and options listed under the second metric in this list, **Increase in High-Performance Companies**, all apply to this **Large Business Payroll Growth** metric.

Building Permits – Harder

Industry Research and Development – Easier

Recent activity

- The $400 million Jobs for Michigan Investment Fund program enacted in 2005 will provide grants, loans and subsidies for research and development in "competitive edge" technologies.

Options

- An education program encouraging communication related to research and development between large businesses and small businesses could result in new technology transfer opportunities.
- Enact a transferable research and development tax credit similar to those in other states, whereby the value of research and development performed by small businesses can be transferred to their commercialization investor/partners in the form of a tax credit. Such tax credits offset commercialization startup costs and foster the development of new supplier relationships between technology developers and manufacturers.

Federal Research and Development – Harder

Options

- Establish an education program to encourage grant seeking at smaller universities and colleges. Large universities already pursue grants on such a scale that there is not much that policymakers can do to improve it.

University Royalty/License Income – Harder

Options

- Establish an education program to encourage college administrations to assign a staff member to learn what's possible and then advise and help researchers establish royalty and licensing agreements. The focus should be on smaller colleges, since the large universities already have offices responsible for pursuing royalties and licensing opportunities.
- Reward Michigan universities and colleges for obtaining revenues from the sale of technology growing out of their research, development and engineering, to encourage more technological transfer.

Entrepreneurial Cohort – Harder

Net Migration Rate – Harder

Appendix 5: Data Sources

Entrepreneurial Change Driver

Growth in Number of Small Businesses

Source: U.S Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

Increase in High-Performance Companies

Sources: Inc.com (2005). "Number of Firms in the Top 500, 1982-2005." Retrieved from http://www.inc.com/resources/inc500/index.html

Deloitte & Touche. "Fast 500". 1997-2005." Retrieved from http://www.public.deloitte.com/fast500/fast_500/search/company_search.asp

New Business Churn Growth

Source: U.S. Small Business Administration. "Small Business Economic Indicators for 2003." Table 6: Employer Firm Formation and Termination Rates by State, 2003. Retrieved from http://www.sba.gov/advo/research/sbei.html.

Small Business Payroll Growth

Source: U.S. Census Bureau (2005). "Statistics of U.S. Businesses." Business Information Tracking series, Tabulations by Enterprise Size. Retrieved from http://www.census.gov/csd/susb/

Nonwage Income Per Capita Growth

Source: U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts: State and Local Personal Income." Retrieved from http://www.bea.gov/bea/regional/data.htm.

Entrepreneurial Vitality Driver

New Business Churn

Source: see New Business Churn Growth entry above

Self-Employment

Sources: U.S. Census Bureau. "Nonemployer Statistics, 1997-2003." Retrieved from: http://www.census.gov/epcd/nonemployer/

U.S. Bureau of Labor Statistics. "Local Area Unemployment Statistics Information and Analysis." Retrieved from http://www.gls.gov/lau

University Spinout Businesses

Source: Association of University Technology Managers. "AUTM Licensing Survey: FY 2003." Startup Companies.

High-Performance Companies

Sources: see Increase in High-Performance Companies, the second entry in this list.

U.S Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

IPO Awards

Sources: Hale & Dorr LLP. "National IPO Database, Longitudinal file 1999-2004." Provided by Hale & Dorr.

U.S. Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

SBIR Awards
Sources: U.S. Small Business Administration. "SBIR and STTR Program Statistics." Retrieved from http://www.sba.gov/SBIR/indexsbir-sttr.html#sbirstats

U.S. Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

STTR Awards
Sources: U.S. Small Business Administration. "SBIR and STTR Program Statistics." Retrieved from http://www.sba.gov/SBIR/indexsbir-sttr.html#sbirstats

U.S. Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

SBIC Awards
Sources: U.S. Small Business Administration. "Financing Statistics, Program Statistical Package." SBIC Program Financing to Small Businesses, Table 7. Retrieved from: http://www.sba.gov/INV/stat/index.html

U.S. Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

Entrepreneurial Climate Driver
Ideas and Innovation Subdriver
Small Business University Licenses/Options
Sources: Association of University Technology Managers. "AUTM Licensing Survey: FY 2003." Licenses and options executed to small businesses (<500).

U.S. Census Bureau. "Statistics of U.S. Businesses." 1997/1998-2002/2003. Retrieved from http://www.census.gov/csd/susb/susb.htm

University Research and Development
Sources: National Science Foundation (2005). "Academic Research and Development Expenditures: Fiscal Year 2003." Retrieved from National Science Foundation WebCASPAR Database, http://caspar.nsf.gov/cgi-bin/WebIC.exe.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product." Retrieved from http://www.bea.gov/bea/regional/gsp.

Patents
Sources: U.S. Patent and Trademark Office, Office of Electronic Information Products (2005). "2005 Performance and Accountability Report." Retrieved from http://www.uspto.gov/web/offices/com/annual.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

Patent Productivity
Sources: see above

National Science Foundation. "National Pattern of R&D Resources." Retrieved from: Indiana Business Research Center, http://www.stats.indiana.edu/sip

NSF Proposal Funding Rate
Source: National Science Foundation. "Funding rate by State and Organization." Retrieved from http://dellweb.bfa.nsf.gov/awdfr3/default.asp

SBIR Funding Rate

Source: "SSTI Weekly Digest."

Financial and Institutional Capital Subdriver

Venture Capital Financing

Sources: PriceWaterhouseCoopers (2005). "MoneyTree Survey: Historical Trend Data." Retrieved from http://www.pwcmoneytree.com/moneytree/nav.jsp?page=historical.

U.S. Bureau of Economic Analysis (2005). Regional Economic Accounts: State and Local Personal Income. Retrieved from http://www.bea.gov/bea/regional/data.htm.

IPO Financing

Sources: Hale & Dorr LLP. "National IPO Database, Longitudinal file 1999-2004." Provided by Hale & Dorr.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

SBIC Financing

Sources: U.S. Small Business Administration."Financing Statistics, Program Statistical Package." SBIC Program Financing to Small Businesses, Table 7. Retrieved from: http://www.sba.gov/INV/stat/index.html

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

SBIR Financing

Sources: U.S. Small Business Administration. "SBIR and STTR Program Statistics." Retrieved from http://www.sba.gov/SBIR/indexsbir-sttr.html#sbir

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

STTR Financing

Sources: U.S. Small Business Administration. "SBIR and STTR Program Statistics." Retrieved from http://www.sba.gov/SBIR/indexsbir-sttr.html#sbir

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

Bank Commercial and Industrial Lending

Sources: Federal Deposit Insurance Corporation (2004). "Statistics on Depository Institutions." Retrieved from http://www2.fdic.gov/sdi/main.asp.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts: State and Local Personal Income." Retrieved from http://www.bea.gov/bea/regional/data.htm.

Private Lending to Small Businesses

Sources: U.S. Small Business Administration (2005). "Micro-Business-Friendly Banks in the United States, 2004 Edition." Table 4B: Top Micro-Business Lenders by State Using CRA Data, 2003. Retrieved from http://www.sba.gov/advo/research/lending.html

U.S. Bureau of Labor Statistics (2005). "Covered Employment and Wages Program, 2004." Retrieved from ftp://ftp.bls.gov/pub/special.requests/cew/2004/.

Business Incubators
Source: U.S. Technology Administration (2004). "The Dynamics of Technology-based Economic Development: State Science and Technology Indicators, Fourth Edition." Retrieved from http://www.technology.gov/reports/

General Growth Subdriver
Gross State Product Growth
Source: U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

Fortune 500 Headquarters
Source: *Fortune Magazine*.

Capital Investment Growth in Manufacturing
Source: U.S. Census Bureau (May 2005). "Annual Survey of Manufactures, Geographic Area Statistics: 2003." 1: Statistics for All Manufacturing Establishments by State. Retrieved from http://www.census.gov/mcd/asm-as3.html.

Foreign Direct Investment Growth
Source: U.S. Bureau of Economic Analysis (2005). Survey of Current Business. "U.S. Affiliates of Foreign Companies, Operations in 2003." Retrieved from: http://www.bea.gov/bea/pubs.htm.

Export Growth
Sources: U.S. Census Bureau, Foreign Trade Statistics (2005). "State Exports by Country." Retrieved from http://www.census.gov/foreign-trade/statistics/state/country/index.html.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp.

Large Business Payroll Growth
Source: U.S. Census Bureau (2005). "Statistics of U.S. Businesses. Number of Firms, Number of Establishments, Employment and Annual Payroll by Employment Size of the Enterprise for the United States and States, 2002." Retrieved from http://www.census.gov/csd/susb/.

Building Permits
Sources: U.S. Census Bureau. "Manufacturing, Mining, And Construction Statistics." Retrieved from: U.S. Department of Housing and Urban Development's, SOCDS Building Permits Database, http://socds.huduser.org/permits/index.html?

U.S. Census Bureau. "Population Estimates. State population datasets." Retrieved from: http://www.census.gov/popest/datasets.html

Industry Research and Development
Sources: National Science Foundation. "National Pattern of R&D Resources." Retrieved from: Indiana Business Research Center, http://www.stats.indiana.edu/sip

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product." Retrieved from http://www.bea.gov/bea/regional/gsp.

Federal Research and Development
Sources: National Science Foundation (2005). "National Pattern of R&D Resources." Retrieved from: Indiana Business Research Center, http://www.stats.indiana.edu/sip

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product." Retrieved from http://www.bea.gov/bea/regional/gsp.

University Royalty/License Income
Sources: Association of University Technology Managers (2004). "AUTM Licensing Survey: FY 2003."

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product". Retrieved from: http://www.bea.gov/bea/regional/gsp.

Entrepreneurial Cohort
Sources: U.S. Census Bureau. "American Community Survey, 1996-2004." Retrieved from: http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_lang=en&_ts=

U.S. Census Bureau. "Population Estimates. State population datasets." Retrieved from: http://www.census.gov/popest/datasets.html

Net Migration Rate
Source: U.S. Census Bureau. "Population Estimates. State population datasets." Retrieved from: http://www.census.gov/popest/datasets.html

Education and Workforce Development Driver
K-12 Education Subdriver
AP Overall
Source: The College Board (2005). "AP Exam Grades: Summary Report 2005." Retrieved from http://www.collegeboard.com/student/testing/ap/exgrd.html.

High School Graduation Rate
Source: Greene, Jay P. and Winters, Marcus A (2005, February). "Public High School Graduation and College Readiness Rates in the United States: 1991-2002." The Manhattan Institute. Retrieved from http://www.manhattan-institute.org/tools/pubs.php?pubtypes=30.

SAT
Source: The College Board (2005). "College Bound Seniors 2005." State and National Reports. Retrieved from http://www.collegeboard.com/about/news_info/cbsenior/yr2005/reports.html.

Methodology: Participation rates are plotted on a graph against average scores for all 50 states. A best-fit power regression is found for the data points, and the equation for the regression function is applied to each state's participation rate to "predict" a score based on participation. These predicted scores are subtracted from the actual average scores received by each state to produce the metric value.

ACT
Source: ACT, Inc (2005). "ACT National and State Scores." Retrieved from http://www.act.org/news/data.html.

Methodology: Identical to SAT metric methodology.

NAEP Mathematics
Sources: National Center for Education Statistics (2005). "The Nation's Report Card: Mathematics." State Results for the NAEP 2005 Mathematics Assessment. http://nces.ed.gov/nationsreportcard/mathematics.

NAEP Reading
National Center for Education Statistics (2005). "The Nation's Report Card: Reading." State Results for the NAEP 2005 Reading Assessment. Retrieved from http://nces.ed.gov/nationsreportcard/reading.

Postsecondary Education Subdriver

Associate's Degrees Granted

Sources: National Center for Education Statistics (2005). "Integrated Post-secondary Education Data System. Completions Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/

U.S. Census Bureau (2005). "2004 American Community Survey." Table B01001: Sex by Age. Retrieved from American FactFinder database, http://factfinder.census.gov/servlet/DTSelectedDatasetPageServlet?_lang=en&_ts=113998810399.

Bachelor's Degrees Granted

Sources: National Center for Education Statistics (2005). "Integrated Post-secondary Education Data System. Completions Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/

U.S. Census Bureau (2005). "2004 American Community Survey." Table B01001: Sex by Age. Retrieved from American FactFinder database, http://factfinder.census.gov/servlet/DTSelectedDatasetPageServlet?_lang=en&_ts=113998810399.

Graduate Degrees Granted

Sources: National Center for Education Statistics (2005). "Integrated Post-secondary Education Data System. Completions Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/

U.S. Census Bureau (2005). "2004 American Community Survey." Table B01001: Sex by Age. Retrieved from American FactFinder database, http://factfinder.census.gov/servlet/DTSelectedDatasetPageServlet?_lang=en&_ts=113998810399.

Physical Sciences and Engineering Degrees

Source: National Center for Education Statistics (2005). "Integrated Post-secondary Education Data System. Completions Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/

Methodology: The following certified instructional programs (CIP) were included for each institution that was judged to award physical sciences and engineering degrees, bachelor's degree or higher:

- Architecture
- Architecture & related programs, other
- Behavioral sciences
- Biological and biomedical sciences
- Biological and physical sciences
- Biopsychology
- Cognitive science
- Computer and information sciences, general
- Computer programming
- Computer science
- Engineering
- Environmental design/architecture
- Environmental science
- Food science and technology
- Information science/studies
- Mathematics and computer science
- Mathematics and statistics
- Natural sciences
- Neuroscience
- Nutrition sciences
- Physical sciences
- Plant sciences
- Science, technology and society

- Soil sciences
- Systems science and theory

Technologist and Technician Degrees

Source: National Center for Education Statistics (2005). "Integrated Post-secondary Education Data System. Completions Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/

Methodology: The following certified instructional programs (CIP) were included for each institution that was judged to award technology and technician degrees, associate's degree or higher:

- Agricultural business technology
- Forest technology/technician
- Architectural technology/technician
- Communications technologies/technicians and support services
- Data processing
- Computer systems analysis
- Data entry/microcomputer applications
- Computer software and media applications
- Computer systems networking and telecommunications
- Computer/information technology administration and management
- Computer and information sciences and support services, other
- Engineering technologies/technicians
- Military technologies
- Science technologies/technicians
- Mechanic and repair technologies/technicians
- Precision production
- Accounting and computer science
- Allied health diagnostic, intervention, and treatment professions
- Clinical/medical laboratory science and allied professions
- Clinical/medical laboratory technician/assistant

Other Innovation Degrees

Source: National Center for Education Statistics.(2003 November). "Integrated Postsecondary Education Data System (IPEDS) Completions Survey." Retrieved from National Science Foundation WebCASPAR Database: http://caspar.nsf.gov/cgi-bin/WebIC.exe.

Methodology: The following certified instructional programs (CIP) were included for each institution that was judged to award degrees in fields relevant to the innovation economy not covered by the purely scientific and technical areas:

- Public relations, advertising, and applied communication
- Teacher education and professional development, specific subject areas
- Technical & business writing
- Economics
- Business, management, marketing, and related support services

Two-Year Tuition

Source: National Center for Education Statistics (2005). Integrated Postsecondary Education Data System. Institutional Characteristics Fall 2004. Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/.

Four-Year Total Fees

Source: National Center for Education Statistics (2005). Integrated Postsecondary Education Data System. Institutional Characteristics Fall 2004. Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas/.

U.S. News Undergraduate Reputation
Source: *U.S. News and World Report* (2005). "America's Best Colleges 2006," Premium Online Edition. Retrieved from http://www.usnews.com/usnews/rankguide/rghome.htm.

Top-Ranked New Economy Graduate Programs
Source: *U.S. News and World Report* (2005). "America's Best Graduate Schools 2006," Premium Online Edition. Retrieved from http://www.usnews.com/usnews/rankguide/rghome.htm.

Other Ranked Graduate Programs
Source: *U.S. News and World Report* (2005). "America's Best Graduate Schools 2006," Premium Online Edition. Retrieved from http://www.usnews.com/usnews/rankguide/rghome.htm.

College Migration
Source: National Center for Education Statistics (2004 August). "Integrated Post-secondary Education Data System. Enrollment Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas.

Entrepreneurial Programs and Curricula
Sources: TechknowledgePoint (2005). Entrepoint, "Top Colleges 2005- Entrepreneurship." Retrieved from www.entrepoint.com

National Science Foundation (2005). "NCES Academic Institutions." Retrieved from: WebCASPAR Database, http://caspar.nsf.gov/cgi-bin/WebIC.exe

Workforce Subdriver
High School Diploma Attainment
Source: U.S. Census Bureau (2004 August). "2004 American Community Survey Summary Tables." Table PCT034: Sex by Educational Attainment for the Population 25 Years and Over. Retrieved from American FactFinder database, http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_lang=en&_ts=113181505860.

Bachelor's Degree Attainment
Source: U.S. Census Bureau (2004 August). "2004 American Community Survey Summary Tables." Table PCT034: Sex by Educational Attainment for the Population 25 Years and Over. Retrieved from American FactFinder database, http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_lang=en&_ts=113181505860.

High-Tech Manufacturing Employment
Sources: U.S. Bureau of Labor Statistics (2005). "Quarterly Census of Employment and Wages." Retrieved from ftp://ftp.bls.gov/pub/special.requests/cew/2004/

Chapple, K., Markusen, A., Schrock, G., Yamamoto, D., & Yu, P (2004). "Gauging metropolitan 'High-Tech' and 'I-tech' activity." Economic Development Quarterly, 18(1), 10-29.

Center for Economic Development and STTI (2004). "Technology Industries and Occupations for NAICS Industry Data."

Methodology: The following manufacturing industries were defined as High-Tech manufacturing based on a combined industry list derived from Chapple et.al (2004) and CED/STTI (2004):
- Aerospace Product and Parts Manufacturing
- All Other Motor Vehicle Parts Manufacturing
- Audio and Video Equipment Manufacturing
- Automobile Manufacturing
- Basic Chemical Manufacturing
- Commercial and Service Industry Machinery Manufacturing
- Communications Equipment Manufacturing
- Computer and Peripheral Equipment Manufacturing
- Gasoline Engine and Engine Parts Manufacturing

- Heavy Duty Truck Manufacturing
- Industrial Machinery Manufacturing
- Light Truck and Utility Vehicle Manufacturing
- Motor Vehicle Body Manufacturing
- Motor Vehicle Brake System Manufacturing
- Motor Vehicle Transmission and Power Train Parts Manufacturing
- Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
- Other Motor Vehicle Electrical and Electronic Equipment Manufacturing
- Pharmaceutical and Medicine Manufacturing
- Plastics Material and Resin Manufacturing
- Semiconductor and Other Electronic Component Manufacturing
- Synthetic Rubber Manufacturing
- Travel Trailer and Camper Manufacturing
- Truck Trailer Manufacturing

High-Tech Services Employment

Sources: See "High-Tech Manufacturing Employment" immediately above.

Methodology: The following service industries were defined as High-Tech manufacturing based on a combined industry list derived from Chapple et.al (2004) and CED/STTI (2004):

- Architectural, Engineering, and Related Services
- Computer Systems Design and Related Services
- Data Processing, Hosting, and Related Services
- Internet Publishing and Broadcasting
- Internet Service Providers and Web Search Portals
- Management, Scientific, and Technical Consulting Services
- Other Telecommunications
- Professional and Commercial Equipment and Supplies Merchant Wholesalers
- Scientific Research and Development Services
- Software Publishers

Physical Science and Engineering Workers

Source: U.S. Bureau of Labor Statistics (2005). "Occupational Employment Survey." Retrieved from https://www.bls.gov/oes

Methodology: The following Standard Occupational Classifications were identified as physical science and engineering jobs:

- Actuaries
- Aerospace engineers
- Agricultural and food scientists
- Agricultural engineers
- All other architects, surveyors, and cartographers
- All other engineers
- All other life scientists
- All other physical scientists
- Architects, except landscape and naval
- Astronomers
- Atmospheric and space scientists
- Biochemists and biophysicists
- Biological scientists, all other
- Biomedical engineers
- Chemical engineers
- Chemists
- Civil engineers
- Computer and information scientists, research
- Computer hardware engineers

- Computer programmers
- Electrical engineers
- Electronics engineers, except computer
- Environmental engineers
- Health and safety engineers, except mining safety engineers and inspectors
- Industrial engineers
- Marine engineers and naval architects
- Materials engineers
- Materials scientists
- Mathematicians6
- Mechanical engineers
- Medical scientists, except epidemiologists
- Microbiologists
- Mining and geological engineers, including mining safety engineers
- Miscellaneous mathematical science occupations
- Nuclear engineers
- Operations research analysts
- Petroleum engineers
- Physicists
- Statisticians

Technologist and Technician Workers

Sources: U.S. Bureau of Labor Statistics (2005). "Occupational Employment Survey." Retrieved from https://www.bls.gov/oes

Methodology: The following Standard Occupational Classifications were identified as technology and technician jobs:

- Aerospace engineering and operations technicians
- All other computer specialists
- All other drafters, engineering, and mapping technicians
- All other life, physical, and social science technicians
- Architectural and civil drafters
- Biological technicians
- Cardiovascular technologists and technicians
- Cartographers and photogrammetrists
- Chemical technicians
- Civil engineering technicians
- Computer software engineers, applications
- Computer software engineers, systems software
- Computer support specialists
- Computer systems analysts
- Database administrators
- Diagnostic medical sonographers
- Electrical and electronic engineering technicians
- Electrical and electronics drafters
- Electro-mechanical technicians
- Emergency medical technicians and paramedics
- Environmental engineering technicians
- Environmental science and protection technicians, including health
- Forensic science technicians
- Geological and petroleum technicians
- Industrial engineering technicians
- Mechanical drafters
- Mechanical engineering technicians
- Medical and clinical laboratory technicians
- Medical and clinical laboratory technologists
- Network and computer systems administrators

- Network systems and data communications analysts
- Nuclear medicine technologists
- Nuclear technicians
- Occupational health and safety specialists and technicians
- Radiologic technologists and technicians
- Respiratory therapy technicians
- Semiconductor processors
- Surgical technologists
- Surveyors

Other Innovation Workers

Source: U.S. Bureau of Labor Statistics (2005). "Occupational Employment Survey." Retrieved from https://www.bls.gov/oes

Methodology: The following Standard Occupational Classifications were identified as other key innovation jobs:

- Architecture Teachers, Postsecondary
- Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
- Biological Science Teachers, Postsecondary
- Business and Financial Operations
- Business Teachers, Postsecondary
- Chemistry Teachers, Postsecondary
- Communications Teachers, Postsecondary
- Computer Science Teachers, Postsecondary
- Economics Teachers, Postsecondary
- Economists
- Engineering Teachers, Postsecondary
- Health Specialties Teachers, Postsecondary
- Management
- Market Research Analysts
- Mathematical Science Teachers, Postsecondary
- Physics Teachers, Postsecondary
- Public Relations Specialists
- Survey Researchers
- Technical Writers
- Vocational Education Teachers, Postsecondary

Adult Education

Sources: National Center for Education Statistics (2004, August). "Integrated Post-secondary Education Data System. Enrollment Survey Fall 2004." Retrieved from IPEDS Peer Analysis System http://nces.ed.gov/ipedspas.

U.S. Census Bureau (2005). "2004 American Community Survey." Table B01001: Sex by Age. Retrieved from American FactFinder database, http://factfinder.census.gov/servlet/DTSelectedDatasetPageServlet?_lang=en&_ts=113998810399.

Business Costs and Productivity Driver

Business Costs Subdriver

Unit Labor Costs

Source: Economy.com, Inc. (2005) "North American Business Costs Review, 11th Edition."

Energy Costs

Source: Economy.com, Inc (2005) "North American Business Costs Review, 11th Edition."

Workers' Compensation Costs

Source: Oregon Department of Consumer and Business Services (December 2004). "Oregon Workers' Compensation Premium Rate Ranking, Calendar Year 2004." Table 2: Workers' compensation premium rate ranking. Retrieved from: http://www.cbs.state.or.us/external/imd/wc_ins.html

Unemployment Insurance Costs

Source: U.S. Department of Labor. "Employment and Training Administration, Unemployment Insurance Data Summary (January 2005). U.S. Summary Tables, Wage and Tax Rate Data." Retrieved from: http://atlas.doleta.gov/unemploy/content/data_stats/datasum04/4thqtr/home.asp

Business Tax Burden

Sources: Cline, R., Fox, W. and Philips, A (2004). "Total State and Local Business Taxes: Nationally 1980-2004 and by State 2000-2004." Ernst & Young, prepared for The Council On State Taxation. Retrieved from http://www.ey.com/global/content.nsf/US/Tax_-_Total_State_and_Local_Business_Taxes_Study

Bureau of Economic Analysis (2005). "Regional Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp.

State Business Tax Structure

Source: Tax Foundation (2006). "State Business Tax Climate Index 2006, Corporate Tax Index." Retrieved from http://www.taxfoundation.org/files/bp51.pdf

Metro Office Rents Index

Source: Economy.com, Inc (2005) "North American Business Costs Review, 11th Edition."

U.S. Census Bureau. "Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2004." Retrieved from http://www.census.gov/population/www/estimates/Estimates%20pages_final.html

Small-Business Health-Care Premiums

Source: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality (2004, September). "Medical Expenditure Panel Survey: Insurance Component." Retrieved from http://www.meps.ahrq.gov/Data_Pub/IC_Tables.htm.

Productivity Subdriver

Gross State Product Per Job

Sources: U.S. Bureau of Economic Analysis (2005, December). "Regional Economic Accounts, Gross State Product." Retrieved from: http://www.bea.gov/bea/regional/gsp.

U.S. Bureau of Economic Analysis (2005, December). "Regional Economic Accounts, State and Local Personal Income." Retrieved from: http://www.bea.gov/bea/regional/spi.

Value Added in Manufacturing Per Hour

Source: U.S. Census Bureau (2005, May). "Annual Survey of Manufactures, Geographic Area Statistics: 2003." 1: Statistics for All Manufacturing Establishments by State. Retrieved from http://www.census.gov/mcd/asm-as3.html.

Service Industry Gross State Product Per Job

Sources: U.S. Bureau of Economic Analysis (2005, December). "Regional Economic Accounts, Gross State Product." Retrieved from: http://www.bea.gov/bea/regional/gsp.

U.S. Bureau of Economic Analysis (2005, December). "Regional Economic Accounts, State and Local Personal Income." Retrieved from: http://www.bea.gov/bea/regional/spi.

Government Efficiency and Regulatory Environment Driver

Government Efficiency Subdriver

Government Gross State Product

Source: U.S. Bureau of Economic Analysis (2005, December). Regional Economic Accounts, Gross State Product. Retrieved from: http://www.bea.gov/bea/regional/gsp.

Units of Government Per Capita

Sources: U.S. Census Bureau (2003). "Census of Governments 2002, Volume 1, Number 1: Government Organization." Retrieved from http://www.census.gov/prod/2003pubs/gc021x1.pdf.

U.S. Department of Commerce, Census Bureau (2003). "State Population Estimates." Retrieved from http://eire.census.gov/popest/estimates_dataset.php.

State and Local Tax Burden

Source: Tax Foundation (2005). "Effective State and Local Tax Burdens by State and Ranking, 2005." Retrieved from http://www.taxfoundation.org/statelocal.html.

Regulatory Environment Subdriver

Malpractice Costs

Source: "2005 Rate Survey of Three Medical Specialties." Medical Liability Monitor. Trends in 2005 Rates for Physicians' Medical Professional Liability Insurance.

Methodology: Malpractice rates depend highly on the medical specialty that the insured practices. To accurately compare rates within three different specialties (internal medicine, general surgery and OB/GYN), the average rates for each specialty are normalized across all the states. The normalized scores for each specialty in a state are then totaled to produce the index score.

Health Mandates

Source: : Council for Affordable Health Insurance (2005). "Health Insurance Mandates in the States" (various years).

Business Liability

Sources: Insurance Information Institute (2005). "Insurance Information Institute Fact Book 2005." Direct Premiums Written, Property/Casualty Insurance, By State By Line.

U.S. Bureau of Economic Analysis (2005). Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp.

Methodology: Premiums totals for workers compensation, products liability, and other liability insurance are averaged, and the average is divided by the gross state product.

Liability Systems

Source: Harris Interactive "2005 State Liability Systems Ranking Study." Conducted for U.S. Chamber of Commerce, Institute for Legal Reform. Retrieved from www.instituteforlegalreform.com/ harris/pdf/HarrisPoll2005-Summary.pdf.

Local Phone Competition
Source: Federal Communications Commission (2005). "Local Telephone Competition and Broadband Development." Retrieved from http://www.fcc.gov/wcb/iatd/comp.html.

Infrastructure Driver
Physical Infrastructure Subdriver
Highway Quality
Source: Federal Highway Administration (2005). "Highway Statistics 2004." Table HM-64: Measured Pavement Roughness, by functional system. Retrieved from http://www.fhwa.dot.gov/policy/ohpi/hss/hsspubs.htm

Bridge Quality
Source: Federal Highway Administration (2005). "Bridge Technology: Deficient Bridges by State and Highway System 2004." Retrieved from www.fhwa.dot.gov/bridge/deficient.htm.

Railway Productivity
Sources: Association of American Railroads (2005). "Railroads and States 2004," State Rankings. Retrieved from http://www.aar.org/PubCommon/Documents/AboutTheIndustry/RRState_Rankings.pdf.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product 2004." Retrieved from http://www.bea.gov/bea/regional/gsp/

Major Air-Market Access
Sources: U.S. Department of Transportation (2005). "Consumer Air Fare Report." Retrieved from http://ostpxweb.dot.gov/aviation/X-50%20Role_files/consumerairfarereport.htm

U.S. Department of Commerce, Census Bureau. "Population Estimates. State Population Datasets." Retrieved from http://eire.census.gov/popest/estimates_dataset.php

Methodology: To develop this metric, six cities were chosen as "target destinations": New York, Chicago, Los Angeles, Boston, Washington, DC, and San Francisco. Total passenger enplanements to and from the 1,000 largest city pairs were summed by state (flights within the same metro area were excluded.) Then the state total enplanement figures were divided by state populations to provide the intended metric: a measurement of access to air transportation to and from the key destinations.

Traffic Congestion
Sources: Texas Transportation Institute (2005). "Urban Mobility Study." Index obtained by request from the Texas Transportation Institute.

U.S. Census Bureau. "Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2004." Retrieved from http://www.census.gov/population/www/estimates/Estimates%20pages_final.html

Methodology: The source data is metropolitan-area-based, and some states have multiple metro areas in the study. In these cases, the index scores within the state are averaged based on the metro area populations.

Digital Infrastructure Subdriver
Broadband Infrastructure
Sources: Federal Communications Commission (2005). "High-Speed Services for Internet Access: Status as of December, 2004." Table 7: High-Speed Lines by Technology. Retrieved from http://www.fcc.gov/wcb/iatd/comp.html.

U.S. Department of Commerce, Census Bureau (2005). "State Population Estimates." Retrieved from http://eire.census.gov/popest/estimates_dataset.php.

Next-Generation Internet

Sources: Abilene Network (2005). "Abilene Connector List." Retrieved from http://abilene.internet2.edu/community/connectors/list.html.

Abilene Network (2004 September). "Abilene Participant List." Retrieved from http://abilene.internet2.edu/community/participants/list.html.

Rural Online – Last Mile Internet

Source: U.S. Department of Agriculture (2005). "Farm Computer Usage and Ownership Report." Retrieved from http://usda.mannlib.cornell.edu/reports/nassr/other/computer/.

Technology in Schools

Source: *Education Week* (2005). "Technology Counts 2005." Table: Access to Technology. Retrieved from http://www.edweek.org/rc/articles/2004/10/15/tc-archive.html.

Quality of Life Driver

Economic Indicators Subdriver

Urban Cost of Living

Source: ACCRA (2005). "Cost of Living Index 2004."

Methodology: The ACCRA survey is metropolitan area-based, and does not include data for some cities. For this metric, the largest city in each state for which cost of living data is available was chosen as the metric value.

Urban Housing Affordability

Source: National Low Income Housing Coalition (2005). "Out of Reach 2005." Retrieved from http://www.nlihc.org/research/index.htm.

Homeownership Rates

Source: U.S. Census Bureau (2005). "Housing Vacancies and Homeownership Annual Statistics." Table 13: Homeownership Rates by State. Retrieved from http://www.census.gov/hhes/www/housing/hvs/hvs.html

Unemployment Rate

Source: U.S. Bureau of Labor Statistics. "Local Area Unemployment Statistics." Retrieved from: http://www.bls.gov/lau/home.htm

Involuntary Part-Time Employment

Source: U.S. Bureau of Labor Statistics. "Geographic Profile of Employment and Wages." Retrieved from: http://www.bls.gov/opub/gp/laugp.htm

Government Assistance

Source: U.S. Census Bureau. "Census, State government finances; assistance and subsidies expenditures." Retrieved from: http://www.census.gov/govs/www/state.html

Per Capita Disposable Income

Source: Bureau of Economic Analysis (2005). "State and Local Personal Income 2004." Retrieved from: http://www.bea.gov/bea/regional/spi/

Health Subdriver

Lack of Health Insurance

Source: U.S. Census Bureau. "Current Population Survey, Annual Social and Economic Supplement." Percent of people without health insurance coverage. Retrieved from: http://www.census.gov/hhes/www/hlthins/reports.html

Per Capita Public Health Spending
Source: National Association of State Budget Offices. "State Health Care Expenditure Report." Retrieved from: http://www.milbank.org/reports/2000shcer/index.html.

Occupational Fatalities
Source: Bureau of Labor Statistics. "Census of Fatal Occupational Injuries." Retrieved from http://data.bls.gov/PDQ/outside.jsp?survey=fi

Limited Activity Days
Source: United Health Foundation. "State Health Rankings, 2001-2004." Retrieved from: http://www.unitedhealthfoundation.org/ahr2005.html

Environmental Quality Subdriver
Clean Air
Source: U.S. Environmental Protection Agency. "Air Data by Geography." Retrieved from: http://www.epa.gov/air/data/geosel.html

Toxic Release Inventory
Sources: United States Environmental Protection Agency (2005). "Toxic Release Inventory: Geography Report." Retrieved from http://www.epa.gov/triexplorer/geography.htm?year=2004.

U.S. Bureau of Economic Analysis (2005). "Regional Economic Accounts, Gross State Product." Retrieved from http://www.bea.gov/bea/regional/gsp.

Renewable Energy
Source: U.S. Energy Information Administration. "Renewable Energy Annual" and "Renewable Energy Trends."

Municipal Waste Recycled
Source: *Biocycle* (various years). "State of Garbage in America."

Water Quality
Source: U.S. Environmental Protection Agency. Office of Ground Water and Drinking Water. "FY 2004 Factoids." Retrieved from http://www.epa.gov/safewater/data/getdata.html

Public Safety Subdriver
Violent Crime Rate
Source: Federal Bureau of Investigation (2005). "Uniform Crime Reports 2004." Retrieved from http://www.fbi.gov/ucr.

Total Property Crime Rate
Source: Federal Bureau of Investigation (2005). "Uniform Crime Reports." Retrieved from http://www.fbi.gov/ucr.

Law Enforcement Personnel
Source: Federal Bureau of Investigation. "Uniform Crime Reports, Crime in the United States." Law Enforcement Personnel. Retrieved from: http://www.fbi.gov/ucr/ucr.

Leisure and Entertainment Subdriver
Arts and Culture Employment
Source: U.S. Bureau of Labor Statistics (2005). "Covered Employment and Wages Program, 2004." Retrieved from ftp://ftp.bls.gov/pub/special.requests/cew/2004/.

Recreation Employment
Source: U.S. Bureau of Labor Statistics (2005). "Covered Employment and Wages Program, 2004." Retrieved from ftp://ftp.bls.gov/pub/special.requests/cew/2004/.

Sports Employment
Source: U.S. Bureau of Labor Statistics (2005). "Covered Employment and Wages Program, 2004." Retrieved from ftp://ftp.bls.gov/pub/special.requests/cew/2004/.

Outdoor Recreation Subdriver
Parkland
Source: National Association of State Park Directors (2005). "The 2004 Annual Information Exchange." 24, 11-14.

National Park Service (2005). "Listing of Acreages by Park, 12/31/02." Retrieved from http://www2.nature.nps.gov/stats/acrebypark02cy.pdf.

Golf Courses
Sources: *Golf Digest*. "Top 100 Golf Courses." Retrieved from http://www.golfdigest.com.

U.S. Department of Commerce, Census Bureau. "Population Estimates. State Population Datasets." Retrieved from: http://eire.census.gov/popest/estimates_dataset.php.

Trails
Sources: American Trails. "National Recreational Trails Program." Retrieved from http://www.americantrails.org.

U.S. Department of Commerce, Census Bureau. "Population Estimates. State Population Datasets." Retrieved from: http://eire.census.gov/popest/estimates_dataset.php

Diversity/Equity Subdriver
Gender Equity
Source: U.S. Bureau of Labor Statistics (2004, February). "Geographic Profile of Employment and Unemployment, 2002." Table 15: Percent distribution of employed persons by sex, race, Hispanic origin, and occupation, 2002 annual averages. Retrieved from http://www.bls.gov/opub/gp/pdf/gp02_15.pdf.

Racial/Ethnic Equity
Source: U.S. Bureau of Labor Statistics (2004, February). "Geographic Profile of Employment and Unemployment, 2002." Table 15: Percent distribution of employed persons by sex, race, Hispanic origin, and occupation, 2002 annual averages. Retrieved from http://www.bls.gov/opub/gp/pdf/gp02_15.pdf.

Hate Crimes
Source: Federal Bureau of Investigation. "Uniform Crime Reports." Hate Crime Statistics. Incidents reported. Retrieved from: http://www.fbi.gov/ucr/ucr.

Rural-Urban Disparity
Source: Corporation for Economic Development. "Development Report Card for the States." Disparity between Rural and Urban Areas. Retrieved from: http://drc.cfed.org/measures/rur_urb_disp.html

Civic Energy Subdriver
Number of Nonprofits
Sources: National Center for Charitable Statistics (2005). All Registered Nonprofits Table Wizard. Retrieved from: http://nccsdataweb.urban.org/tablewiz/tw_bmf.php

U.S. Department of Commerce, Census Bureau. "Population Estimates. State Population Datasets." Retrieved from: http://eire.census.gov/popest/estimates_dataset.php

Charitable Giving
Sources: Internal Revenue Service (2005). "Individual Tax Statistics." Individual Income and Tax Data by State and Size of Adjusted Gross Income. Retrieved from: http://www.irs.gov/taxstats/article/0,,id=103106,00.html

Bureau of Economic Analysis (2005). "State and Local Personal Income 2004." Retrieved from: http://www.bea.gov/bea/regional/spi/

Voter Turnout

Source: U.S. Census Bureau. "Current Population Survey." Table on Reported Voting and Registration for Total and Citizen Voting-Age Population by State, 1974-2004. Retrieved from: http://www.census.gov/population/www/socdemo/voting.html

Appendix 6: Methodology: *Entrepreneurship Score Card*

General

The foundation of good benchmarking is the selection and qualification of sound metrics, indicators that provide comparable measures for all states on an annual or biennial basis. This approach requires valid, reliable data sources that are available publicly and creative exploration of other data previously not used for this kind of application. The *Score Card* makes use of these multiple sources to obtain specific measures for 126 metrics (*See Appendix 5: Data Sources*.) Where practicable the data is obtained for the past 5 years. Where data is not yet available for 2005, data from 2004 or 2003 is used. All data is the most current available as of March 2006, and 68 percent of all metrics are populated with 2004 and 2005 data. As new data becomes available the measures for previous years are revised. In this way the Score Card annually provides the most up to date data set for both current and previous years. If a new metric is added, measures are obtained for all back years available to 2000. The sections that follow explain in greater detail how metrics are obtained and aggregated and how star performance and grades are derived.

Metric Calculation

In order to compare metrics with different units of measurement such as dollars or number of residents, the data for the *Score Card* has to be normalized. Many benchmarking reports use a z-score or standardized score, which is the raw value of the metric minus the mean of all the raw values, divided by the standard deviation of the values. The resulting z-scores have a mean of zero and a standard deviation of one, or what is called a standard normal distribution, and allow an easy comparison across metrics. A major drawback of this method is that it imposes a normal distribution on all metrics, many of which might actually be skewed to the left or the right, e.g. a few states might score very well, followed by a cluster near the mid point, with the rest gradually declining in along tail. Forcing scores into a normal distribution can introduce substantial biases. The z-score method also gives significant weight to unusually high or low scores. An unusual score could merely represent an exceptional year for a state rather than the general trend, which the *Score Card* is trying to uncover. Even with these shortcomings, the z-score method is the most widely used today, partly because nothing better has come along, until recently.

The *Score Card* uses a sophisticated method that is robust to outlier scores so that one extreme value is not going to change the scores of the other states, and it does not impose an artificial structure on the distribution of state values and therefore does not bias data that is not normally distributed. The modified median score takes the differences between the raw value and the median rather than the mean, comparing it therefore less to the top performance but rather to the performance of the majority of states. It then is normalized with the following method: for each state, get the difference between its raw score and the raw score of every other state; from these 49 numbers, get the median and repeat for the next state, resulting in 50 medians; then take the median of these medians as the measure of central tendency.

Each metric is reported by raw score, normalized score, rank and recent change. The normalized score enables multiple metrics to be added together to give subdriver and driver composite scores. The normalized score also serves as a means to convey a state's performance relative to the "middle state(s)." For easier readability the normalized score is scaled so that the median is 100 for each metric, denoted by a heavy line across the table. Consequently, the reader can get a quick sense of how far a particular state is from the mid point by observing how far it is above or below 100. Further, the reader will find it helpful to know how a particular state clusters with other states of like scores. This is shown by five shadings on the metrics table. A shading includes those states that fall in one-fifth of the full range of normalized scores. While a state might change somewhat in ranking, if it stays in the same performance/shading group, one can conclude little change relative to competitors and comparators. Alternatively, if a state ranking stays fairly stable over several years but it moves up in shading cluster, one can conclude improvement. For this reason

the reader is encouraged not to rely singularly on rankings to judge a state's competitive position. Although widely used, rankings alone can lead to erroneous judgments. The "modified median" method of normalizing scores is state of the art and likely will become common practice in the future.

Subdriver and Driver Calculation

Once the metric scores have been calculated for those metrics making up a Subdriver, the modified median scores are averaged to produce a Subdriver score and the Subdriver page displays the state scores in the form of star performances associated with those average scores. For example, five stars mean the state performed in the top 20 percent of the range of averaged scores. Driver star performance is calculated from the original metric scores in the same way as for Subdrivers. This year's *Score Card* also uses an innovative method of updating data. Typically, benchmarking studies use the most recent data available when a report is released. Often these data are one to three years behind the actual release date. Report issuing organizations/authors seldom go back to adjust the scores/grades of previous years when finally data becomes available for the particular release year. Past results might then erroneously show facts/trends that have already long changed. This *Score Card* method actually recalculates previous years' results based on new data available for earlier years.

In order to make past aggregate results as representative as possible of the actual data years, wherever possible, the *Score Card* method uses the actual data year for the corresponding *Score Card* year when aggregating, i.e. if there is 2003 data, it will be used for the 2003 *Score Card* aggregate results. However, if there is no new data available in the following year, last year's data will be reused when the metrics are aggregated (though the metric pages will still show whatever years are available). Hence, in some cases where Subdrivers have not much new data in recent years, there could be hardly any change between the 2003 and 2005 *Score Card* raw scores. Each edition of the *Score Card* results can therefore be viewed as an "update," reflecting only new scores where the underlying data actually changed.

Another related innovation is the response to missing data points. Whenever a single state has a missing value for a year, the previous year's raw value is used as a best estimate of that year, making an effort to always compare all states over the same number of metrics (except when a particular state's metric information is missing for all years).

The *Score Card* reports one letter grade. The metrics for the three entrepreneurial drivers in the beginning of the data findings are aggregated into an Entrepreneurial Dynamism grade, using the same normalization and aggregation method as described above. To report the competitive position of states, the average scores for Entrepreneurial Dynamism are then converted to letter grades according to their position relative to the leader with an outcome similar to a curved grading method used in the classroom. The average scores are converted to a range between 0 and 4.33 according to a typical grade-point scale, maintaining their relative position in the distribution, and then assigned a letter grade according to their value. The range of values associated with a half letter grade is always equivalent to 0.33 points. (For example, a B+ is any value between 3 and 3.33 and an A– is any value between 3.33 and 3.66.) Anything below 0.33 is assigned an F.

Appendix 7: Progress and Opportunities 2004–2006

Methodology

A five-question survey was e-mailed to thirty selected individuals on February 15, 2006, with a requested response deadline of February 22, 2006. These individuals represented organizations and agencies concerned with economic development in Michigan and did not constitute a valid and reliable sample in any traditional quantitative statistical sense. Using the time period of January 2004 through December 2005 as a guide, nineteen respondents answered three open-ended questions about activities, initiatives or programs demonstrating "progress and opportunities" supporting entrepreneurship and an entrepreneurial economy in the state. Those responses were used to prepare the Context, Progress and Opportunities report on Pages 27-38. The date constraint represents a time period for which quantitative data are not available for all of the metrics used in the *Score Card* calculations. In the interests of clarity and space, the report condensed or summarized some responses. Unfortunately, it was not possible to include every topic, event or activity reported by the respondents.

Respondents

The following individuals responded to the Progress and Opportunities Survey conducted by e-mail from February 15 to 22, 2006. We are grateful for their time, effort and insights.

Thomas Anderson, Senior Director, Automation Alley Technology Center, Pontiac
Lindsay Aspegren, Co-Founder and Partner, North Coast Technology Investors LP, Ann Arbor
David Brenner, Managing Partner, IdeaWorks LLC, Grand Rapids
Mark H. Clevey, Executive Director, Small Business Foundation of Michigan and Vice President, Small Business Association of Michigan, Entrepreneurial Development Center, Lansing
Allen Cook, Assistant District Director of Marketing and Outreach, U.S. Small Business Administration, Detroit
Jim Croce, Director, Next Energy Inc., Detroit
Timothy L. Faley, Managing Director, Zell Lurie Institute for Entrepreneurial Studies, University of Michigan, Ann Arbor
Charles Fitzpatrick, Executive Director, LaBelle Entrepreneurship Center, Central Michigan University, Mt. Pleasant
Martin Gibbs, Executive Assistant, Office of the Director, Michigan Department of Labor and Economic Growth, Lansing
Carol Lopucki, State Director, Michigan Small Business Technology & Development Center, Grand Rapids
Scott Loveridge, Professor and State Leader, Michigan State University Extension Services, East Lansing
Loch McCabe, President, Shepherd Advisors LLC, Ann Arbor
Patrick Morand, Managing Director, Southwest Michigan Life Sciences Venture Fund, Kalamazoo
Sue A. Peters, Associate Program Officer, Charles Stewart Mott Foundation, Flint
Doug Rothwell, President, Detroit Renaissance, Detroit
Bradley Shaw, Licensing and Marketing Manager, Michigan State University, East Lansing
Nancy Weatherford, Director of Entrepreneurship, CyberMichigan, Ann Arbor
David Weaver, President, Great Lakes Angels, Bloomfield Hills
Dennis West, President, Northern Initiatives, Marquette

Appendix 8: How Other Studies Rate Michigan's Economy

Summary

The Entrepreneurship Score Card is the only nationwide economics study whose primary emphasis is entrepreneurship. But several national studies that measure similar factors in state economies, though for different purposes, are useful for comparing measures and interpretations. A review of such studies provides an informal validity check for the *Score Card* and, more importantly, might inspire approaches to building and advancing entrepreneurial economies. Direct comparisons are not always possible because methodologies, release dates and terminology vary. But, taken as a whole, conclusions regarding Michigan's competitive position as reported in the *Score Card* approximate those of other studies.

Comparisons

Five major reports are compared in the summary below:

- The *Development Report Card of the States*, 2006, prepared by the Corporation for Enterprise Development on an annual basis for more than ten years;
- The *State Competitiveness Report* prepared in 2005 by the Beacon Hill Institute of Suffolk University in Massachusetts;
- The Milken Institute's *State Technology and Science Index*, 2004;
- The *MAC Index* prepared by CERC (Connecticut Economic Research Center), 2004-05;
- The aggregate results of one compendium of rankings: the *America's Best Cities & States: The Annual Gold Guide to Leading Rankings* 2004; National Policy Research Council.

The table at the end of this appendix shows the ranks by economic driver or subdriver according to *The Entrepreneurship Score Card* 2005-06 for Michigan. Those categories from the five studies that most closely resemble the drivers and subdrivers in this *Score Card* are compared with Michigan's scores. The score is shown as a rank.

The only method available for cross-checking the scores of similar benchmark reports is to compare either ranks or grades on aggregate measures that seek to measure similar characteristics or drivers. In many cases, *The Entrepreneurship Score Card* for Michigan matches well with scores arrived at by the five other studies. Both the *Score Card* and national comparator reports concur, for example, that Michigan ranks in the fourth quintile for physical infrastructure. In environmental quality, Michigan is in the third rank quintile across the board. In addition, several reports and the *Score Card* rank Michigan in the low second to upper third quintile for K-12 education with ranks ranging from 19 to 24.

Areas of wider discrepancy relate to entrepreneurship and small business.[6] Definitions of entrepreneurship vary widely across reports, which make comparisons difficult. To uncover subtleties of the entrepreneurial economy of states, the *Score Card* uses many more related metrics than any of the other benchmark reports. The *Score Card* adds clarity by differentiating between level or status measures and growth or change measures. And it is Entrepreneurial Change, in fact, that pulls Michigan scores lower than in most other reports. On average, other reports rank Michigan on various entrepreneurship measures at around 22, while the *Score Card* ranks the state at 31.

[6] The only cross-state benchmark report that focuses on small business is the Small Business Survival Index with a primary focus on taxes and related business cost factors. The Index does not normalize its raw data, so is difficult to compare with other benchmarks. It mostly relates to the Entrepreneurship *Score Card's* Business Costs and Regulatory Environment metrics. Michigan's strong rank of 5 in the Index is mostly due to a very different methodology and many tax variables not included in the *Score Card*.

Insight: In other words, Michigan's apparently slow progress in entrepreneurial and small business growth figures prominently in the state's Entrepreneurial Dynamism grade of D.

Entrepreneurship Score Card Rankings (2006) Compared to Rankings of Other Recent National Studies

Entrepreneurship Score Card 2006		*Other Recent National Studies (2005-06)*	
Rankings			
From 1 (strongest) to 50 (weakest)			
		Development Report Card of the States (2006)	
		Corporation for Enterprise Development [i]	
K-12	**24**	**21**	Human Resources
Physical Infrastructure	**37**	**29**	Infrastructure Resources
Environmental Quality	**28**	**21**	Resource Efficiency
		State Competitiveness Report (2005)	
		Beacon Hill Institute [ii]	
Infrastructure	**37**	**37**	Infrastructure
Environmental Quality	**28**	**30**	Environmental Policy
		State Technology and Science Index (2004)	
		Milken Institute [iii]	
K-12	**24**	**19**	Human Capital Investment
Postsecondary Education	**5**		
Entrepreneurial Dynamism	**31**	**15**	Research and Development Inputs
		37	Risk Capital and Entrepreneurial Assets
		MAC Index (2004-05)	
		Manufacturing Alliance of Connecticut [iv]	
Business Costs	**45**	**48**	Costs
Physical Infrastructure	**37**	**46**	Physical Infrastructure
Entrepreneurial Dynamism	**31**	**36**	Economic Structure
		16	Technology
		America's Best Cities and States (2004)	
		National Policy Research Council	
Physical Infrastructure	**37**	**36**	Infrastructure
Environmental Quality	**28**	**25**	Environment
Entrepreneurial Dynamism	**31**	**18**	Entrepreneurship and Small Business
		Small Business Survival Index (2005)	
		Small Business & Entrepreneurship Council [v]	
Business Costs	**45**	**5**	Overall Rank
Regulatory Environment	**15**		

[i]Corporation for Enterprise Development, 2006. Development Report Card of the States; Indiana; http://drc.cfed.org/grades/indiana.html
[ii]Beacon Hill Institute. Metro Area and State Competitiveness Report 2005. http://www.beaconhill.org/
[iii]Milken Institute. State Technology and Science Index: Enduring Lessons for the Intangible Economy. http://www.milkeninstitute.org/pdf/state_tech_sci_index04.pdf
[iv]Manufacturing Alliance of Connecticut. 2003 MAC Index. http://www.mact.org/mac_index.php
[v]Small Business & Entrepreneurship Council, October 2005. http://www.sbecouncil.org/media/pdf/SBSI_2005.pdf

Appendix 9: Glossary

This glossary defines terms used in the Michigan Entrepreneurship Score Card for 2006. Some of the definitions are generic, and some are specific to this document.

Absolute Change: See Change.

Benchmarking: Setting a referral point or standard in order to set an objective or judge the goodness of a specific business activity. Here, Benchmarking means rating and ranking states on factors that reflect economic conditions to determine "best in class" then seeking to learn from the leaders.

Business Costs: Expenditures to do business; all expenses, including tax, labor, production, marketing, and overhead costs.

Business Churn: (also business turnover and net new businesses): Number of business startups minus number of business terminations. The Business Churn statistic indicates how much the total number of active businesses has changed from year to year.

Change: The metrics tables include a column showing how much each state's score changed from a base year to the current year, usually over a span of three years. Relative change is reported unless proximity to zero would make the number deceptive, in which case the absolute change is reported. The label at the top of the column indicates when absolute change is reported.

- **Absolute Change**: The score in the latest year minus the score in the base year.
- **Relative Change**: The percent change derived by dividing the absolute change by the score in the base year. The column label for relative change says "(%)" or "(% points)."

Drivers: Sets of related factors that are generally agreed to reflect business conditions that affect entrepreneurial activity.

- **Primary Drivers**: The three Drivers that determine the Entrepreneurial Dynamism grade: Entrepreneurial Change, Entrepreneurial Vitality, and Entrepreneurial Climate. Each is comprised of factors that reflect entrepreneurial growth.
- **Secondary Drivers**: Five Drivers comprised of factors that reflect economic conditions: (1) Education and Workforce Development, (2) Business Costs and Productivity, (3) Government and Regulatory Environment, (4) Infrastructure, and (5) Quality of Life.
- **Subdrivers**: Subdivisions of Primary Drivers and Secondary Drivers. Each Subdriver is comprised of a cluster of metrics.
- **Metrics**: Statistics on specific factors that reflect Michigan's business conditions and rate of entrepreneurial growth, clustered under the Drivers and Subdrivers.

Entrepreneurial Change: Increase or decrease in business activity. The Entrepreneurial Change Ranking and Rating are based on five metrics that reflect business numbers and income (for example, Growth in Number of Small Businesses). Entrepreneurial Change is one of three Primary Drivers that comprise Entrepreneurial Dynamism (q.v.).

Entrepreneurial Climate: A set of business conditions that affect growth in entrepreneurship. The three Subdrivers of Entrepreneurial Climate are (1) Ideas and Innovations, derived from six

metrics, (2) Financial and Institutional capital, derived from eight metrics and (3) General Growth, derived from twelve metrics. Entrepreneurial Climate is one of three Primary Drivers that comprise Entrepreneurial Dynamism (q.v.).

Entrepreneurial Dynamism: The Entrepreneurial Dynamism grade reflects the rate of Michigan's entrepreneurial growth in comparison with the rate of growth in other states. It is determined by comparing the composite total scores of all states for the three Primary Drivers and their metrics using the method described in an appendix to the *Score Card* document.

Entrepreneurial Economy: An entrepreneurial economy is characterized by the robust creation, retention, expansion and attraction of first and second-stage small business entrepreneurs and their companies.

Entrepreneurial Vitality: Entrepreneurial Vitality metrics reflect events that indicate levels of business activity. The Entrepreneurial Vitality Ranking and Rating are based on eight metrics that reflect entrepreneurial activity, for example, IPO (Initial Public Offerings) Awards. Entrepreneurial Vitality is one of three Primary Drivers that comprise Entrepreneurial Dynamism (q.v.).

Entrepreneurship: Initiation of business activity. Entrepreneurship also is considered to include initiatives that make increased business activity possible, such as innovations in management, operations, research and development, production, and marketing.

Idea Economy (also knowledge economy, creative economy or innovation economy): The expected successor to the industrial economy. Just as the shift from an agricultural economy to an industrial economy displaced a great many agricultural workers and farms over a period of decades, the ongoing transition to a knowledge economy entails churning among businesses and displacement of industrial workers. Infrastructures for learning and communication are expected to continue to increase in economic importance in relation to transportation and public utility infrastructures.

Innovation: Introduction of a new business practice or product. Ideas and Innovations is a Subdriver for the Primary Driver Entrepreneurial Climate. The metrics used to derive the Ideas and Innovations ranking and rating either reflect investment in research (for example, NSF Funding Rate) or reflect completed research (for example, Patents).

Median: The center of an ordered row or list. The median score for a metric factor for 50 states falls between the scores of the 25^{th} and 26^{th} states when they are ranked from highest to lowest. The median usually differs from the average, which is the sum of the scores divided by the number of cases.

Metrics: See Drivers.

Modified Median: A statistical method for normalizing scores based on the median rather than the mean as a center point. The Modified Median method eliminates the skewing that occurs when the average is over-affected by domination of an exceptionally high or low score. The Modified Median is discussed in more detail in Appendix 6: Methodology.

Normalization: Using statistics methods to adjust a set of scores so they fit on a standard scale, in order to compare them to another set of normalized scores derived from another variable, or to combine the sets. Normalization is discussed in more detail in Appendix 6: Methodology.

Productivity: A measure of economic efficiency. How much service or how many goods are produced per unit of input? Since labor traditionally has been the predominant production cost, productivity is commonly assumed to reflect the efficiency of workers.

Rankings: Numbers from one to 50 assigned to states sorted in order on their raw scores for each metric. Ranking indicates how many states scored higher and lower than Michigan. Compare with Ratings, which indicate how much the state scores differed, not just what order they fell in.

Ratings: One- to five-star ratings for each Driver are assigned to each state, based on the actual data, not just rankings. The ratings show which clusters or groups of states had similar scores, and make it easy to see when just one or two states had exceptionally high or low scores. Ratings in the tables of metrics are indicated by shading.

Relative Change: See Change.

Secondary Drivers: See Drivers.

Small Business Innovation Research (SBIR): An SBA program through which several government agencies provide small businesses with grants for research, development and commercialization of products the agencies would like to purchase. SBIR rules support technology transfer by encouraging the use of up to 49 percent of a given grant for research at nonprofit research institutions. These grants do not have to be repaid.

Small Business Investment Companies (SBICs): Private investment companies supported and regulated by the U.S. Small Business Administration to provide investment pools of risk capital in local markets.

Small Business Technology Transfer Research (STTR): An SBA program through which several government agencies provide small businesses with grants for research, development and commercialization of products the agencies would like to purchase. STTR awards provide especially strong incentive for technology transfer agreements with university researchers, because unlike SBIR awards, 51 percent of the funding does not have to go to a small business primary researcher. These grants do not have to be repaid.

Spinouts: New companies established by existing companies. The Score Card report also refers to new companies whose products are a result of technology transfer from universities as spinouts.


AUTOMATION
ALLEY


CMU
CENTRAL MICHIGAN
UNIVERSITY


GREAT LAKES
ANGELS


LAWRENCE
TECHNOLOGICAL
UNIVERSITY
LEAR ENTREPRENURIAL CENTER


MICHIGAN ENTREPRENEURSHIP
EDUCATION NETWORK
a program of
CyberMichigan


MICHIGAN VCA
VENTURE CAPITAL ASSOCIATION


NEXTENERGY


SHEPHERD
ADVISORS


SBAM
Small Business Association of Michigan